



February 2, 2017

Reference No. 014737

Ms. Ashley Similo  
United States Environmental Protection Agency  
Region 2  
290 Broadway, 20<sup>th</sup> Floor  
New York, NY 10007-1866

Dear Ms. Similo:

**Re: 2016 Annual Report  
JIS Landfill Site**

On behalf of the JIS Performing Parties Group, GHD is submitting the 2016 Annual Report for the JIS Landfill Site.

Should you have any questions or comments, please do not hesitate to contact either Chris Young (demaximis) at 610-435-1151 or myself at 519-884-0510.

Yours truly,

GHD

A handwritten signature in black ink that reads "James Kay". The signature is written in a cursive style with a large, stylized "K" at the end.

James Kay

JK/mg/5

Encl.

cc: Chris Young  
Irv Freilich  
Erica Bergman (NJDEP)  
JIS Performing Parties Group\



# 2016 Annual Report

JIS Landfill Site  
South Brunswick, New Jersey

JIS Landfill Site Performing Parties Group



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## 1. Introduction

On behalf of the JIS Landfill Site Performing Parties Group (JIS Group), GHD (formerly known as Conestoga-Rovers & Associates) is submitting this annual progress report for the period January 2016 through December 2016 for the JIS Landfill Site (Site). The last annual progress report was submitted in February 2016 that covered January 2015 through December 2015. This annual report includes all sampling and monitoring activities completed since the last report, including those associated with the vapor intrusion assessments as well as all other components that were previously reported.

Remedial Design/Remedial Action activities at the JIS Site were conducted pursuant to Administrative Consent Orders (ACO) entered into in 1997 and in 2004 by the JIS Group and the NJDEP. The work associated with these ACOs is now complete.

An Administrative Order (AO) covering future work to be performed at the JIS Site was issued by the USEPA to the JIS Group on September 3, 2010. This AO includes implementation/monitoring of the biosparge system and other remedial components for the Site as described in the Record of Decision (ROD), ROD Amendment, and the approved Remedial Action Work Plan. This annual progress report is being prepared pursuant to Section 13.0 of the Remedial Action Work Plan.

### 1.1 Site Changes

In 2014, the JIS Group filed suit against JIS Co. and its principals to enforce a judicially approved settlement agreement requiring JIS Co. to transfer ownership of the JIS property to the JIS Group's designee, de maximis, inc. In 2016, the Court ordered that title in the property be transferred to de maximis, inc. Title to the property is now in de maximis, and JIS Co. is no longer in possession of the property. The JIS Group has erected a fence around the entire property and has installed security cameras. However, the Court's judgment requiring that the property be transferred was appealed by JIS Co., and the appeal is still pending.

### 1.2 Groundwater Monitoring Program Changes

In 2015, two modifications were initiated to the groundwater monitoring program and were subsequently implemented in 2016. These two modifications were as follows:

1. In accordance with the September 16, 2014 letter specifying the details of the groundwater monitoring program and approval by the USEPA on November 17, 2015 , the frequency of groundwater monitoring was reduced as follows:
  - The groundwater monitoring wells along the central axis (MP-6, MW-53, MW-44, MW-49, MW-50) of the primary flow path of the plume emanating from the landfill have had their sampling frequency reduced from quarterly to semi-annually. All other groundwater monitoring wells in the biosparge monitoring well network, outside of the primary flow path of the plume have had their sampling frequency reduced from semi-annually to annually.



- The wells monitoring the downgradient portion of the plume beyond the Site property boundary areas have had their sampling frequency changed from annually to biennially. No samples were required to be collected in 2016 from these wells. The next sampling event for these wells will be performed in March 2017 to provide the data necessary to support the delineation of the Classification Exception Area in May 2017.
- 2. Three sentry wells (MW-68, MW-69, and MW-70) were installed in 2015 and two former pump test wells were also converted into monitoring wells (PW-1 and PW-2). These wells were sampled semi-annually in 2016, completing the second of the two year program of semi-annual sampling for these wells previously agreed to with the USEPA. The locations of these wells are depicted on Figure 9.

#### **Possible Additional Work**

- Three well nests in the off-Site downgradient portion of the plume are scheduled for possible relocation. Wells MW-22, MW-23, and MW-34, which are located on the Dallenbach property to the east of the JIS Site, will be re-located if the property owner's final plan for development of the property poses a conflict with the current locations of these wells. The wells will be moved prior to the development's implementation.
- The JIS Group has been made aware of a plan to develop another property located to the east of the JIS Site; immediately east of Cranbury South River Road in Monroe Township. The property planned for development is currently owned by Mr. Protinick, but a developer is in the process of obtaining site plan approval from the Township for the development of a warehouse that will be built in an area where some groundwater monitoring wells are currently located. The JIS Group has been in communication with USEPA regarding the potential closure, replacement, or re-location of some of these wells.

## **2. Routine Activities Performed in the Reporting Period**

### **2.1 Biosparge Groundwater Monitoring Program**

#### **Overview**

The biosparge groundwater monitoring program consists of the collection and analysis of groundwater samples from 45 monitoring wells (MW-42 through MW-55 and MP-6) that were installed along the alignment of the biosparge system. The wells are grouped into 15 well nests with each well nest including a shallow, intermediate, and deep screened interval. The wells in the core of the JIS plume (located between wells MW-53 and MP-6) are now sampled semi-annually (EPA approved semi-annual monitoring on October 30, 2014), whereas the remainder of the wells in the biosparge monitoring network are sampled annually. The samples from the wells that are on the annual cycle are collected in March/April of each year to coincide with the timing of the sampling that is used for the downgradient plume biennial sampling event that is used for the Classification Exception Area certification. The most recent biosparge sampling events were conducted on the following dates:



- October 6 – 9, 2015 (start of semi-annual monitoring)
- April 12 – 25, 2016
- October 10 - 13, 2016

All of the wells in the biosparge monitoring program are sampled for VOCs (including 1,4-dichlorobenzene and 1,2,4-trichlorobenzene), arsenic, and manganese.

A groundwater sample is also collected from well MW-5 as part of the biosparge monitoring program. This well is located immediately downgradient of the landfill and upgradient of the biosparge system, and provides an indication of the groundwater quality emanating from the landfill. Samples from the 2015 installed sentry wells and the converted PW wells were also collected in 2016.

The biosparge monitoring program focuses on tracking the oxygen and VOC concentrations in the groundwater. The most prominent VOCs are:

- Benzene
- Chlorobenzene
- 1,4-dichlorobenzene
- Xylenes (total)
- 1,2,4-trichlorobenzene

Manganese is also a primary compound of concern although it is a naturally occurring compound and is not a compound that poses a health-related risk. Plots of the chemical concentration trends for these compounds are presented in Figures 1 through 7.

The analytical results from the biosparge monitoring program for this reporting period are presented in Table 1. The 2016 data are mostly consistent with results from previous years and are summarized as follows:

#### **Groundwater Flow**

Groundwater at the JIS Landfill flows easterly. The contaminant plume is limited to a relatively narrow band emanating in the area of MW- 5 and moving downgradient between on-Site wells MW-53 and MP-6 (as shown in Figure 9). The installation of the sentry wells (MW-68, MW-69, and MW-70) has further refined the lateral extent of the core of the plume as passing through the shallow and intermediate zones of the aquifer at wells MW-69 and MW-70 on a path between MW-5 and MP-6. The biosparge injection system is located immediately downgradient of MW-53 and MP-6 and provides treatment of the groundwater prior to and beyond the downgradient property boundary. This system has been successful in treating and mitigating further contaminant migration beyond the eastern property boundary.

#### **VOC Trends**

In 2016 well MW-5, located closest to the landfill in the primary core area, had total VOC concentrations ranging between 1,900 and 4,700 parts per billion (ppb). This is a substantial



reduction from the 2015 concentrations which ranged between 6,000 and 35,000 ppb. The total VOC concentration at MW-5 has been declining since July 2014.

Monitoring wells MW-69 S and MP-6 S, which are located 200 and 300 feet downgradient of MW-5 respectively, effectively reflect conditions along the primary plume axis downgradient of MW-5 and upgradient of the treatment zone. Total VOC concentrations at MW-69 S and MP-6 S exhibit significant reductions when compared spatially to MW-5. The total VOC concentrations ranged from 14 to 340 ppb at MW-69 S and from 695 to 1,083 ppb at MP-6 S in 2016.

Monitoring well MW-50 is the next downgradient well along the plume axis. It is located approximately 100 feet downgradient from the biosparge injection system. Total VOC concentrations at MW-50 were detected at significantly reduced concentrations. The highest total VOC concentration was detected at 6 ppb in the intermediate zone at this well nest during the 2016 sampling events, while no individual VOC exceeded NJGWQS's.

MW-49 was the only well with an exceedance of a NJGWQS in the group of wells located 100 feet downgradient of the biosparge system. Benzene was detected at 1.6 ppb (compared to a criteria of 1 ppb) in the shallow well at MW-49 and trichloroethene (TCE) was detected in the intermediate well at 1.8 ppb (compared to a criteria of 1 ppb). These data demonstrate that the biosparge system is successfully supplementing the natural degradation processes to effectively remediate the JIS plume on or near the JIS property.

The groundwater samples that have been collected from the sentry wells (MW-68, MW-69, and MW-70) demonstrate that the overall total VOC concentrations approaching the biosparge system are currently decreasing. For example, the total VOC concentration at MW-69 S was 8,500 ppb in May 2015 and has decreased to 670 ppb in October 2016. Similarly, the total VOC concentration at MW-70 I decreased from 1,700 ppb in May 2015 to 141 ppb in October 2016.

While TCE has been observed in a few of the biosparge monitoring wells over the past 10 years, the concentration of TCE in the on-Site monitoring wells has historically never exceeded 5 ppb; however, in October 2015, TCE was present in three wells at concentrations that exceeded 5 ppb. The observed concentrations in October 2015 were:

MW-5	43 ppb
MP-6 D	160 ppb
MW-69 I	210 ppb

In the 2015 Annual Report, the JIS Group noted that it would continue to monitor these conditions in 2016 to better understand potential TCE trends. The sampling performed in 2016 has shown that the TCE detected in 2015 was the result of a temporal spike. In October 2015, the highest concentration of TCE (219 ppb) was observed at one of the sentry wells (MW-69 I). During the next sampling event in April 2016, the highest observed concentration of TCE was 370 ppb, but was located further downgradient, immediately adjacent to the biosparge system at well MP-6 I. The highest concentration of TCE observed during the October 2016 was still located at the MP-6 well location although the concentration had decreased to 190 ppb. The TCE concentrations for the wells along the central axis of the JIS plume are presented in Table 2. A summary of the data from the key wells showing the TCE concentration trend is as follows:



Well	March 2015	October 2015	April 2015	October 2016
MW-5	ND	43	2	0.3
MW-69 I	60	219	49	2.7
MP-6 I	0.3	3.3	370	150

Similar to what has been observed in the past for benzene, the TCE levels noted in 2015 appear to be the result of a temporal spike in the plume core, which was observed to migrate and attenuate along the downgradient plume axis in 2016. The highest TCE concentration detected in the monitoring well network located 100 feet downgradient of the system was only 1.8 ppb (at well MW-49) in 2016.

### Dissolved Oxygen Trends

The dissolved oxygen concentrations in the biosparge monitoring wells are presented in Figure 8 and on Table 3. The series of 120 injection wells that are used to deliver the compressed air into the aquifer from the compressor/control building are also shown on Figure 8. The oxygen concentrations measured in the most recent 2016 sampling event from the 45 groundwater monitoring wells that make up the biosparge monitoring well network fall into the following categories:

<0.2 ppm	(oxygen deficient)	5 wells	(1)
> 0.2 ppm but < 2 ppm	(may be limiting the biodegradation)	4 wells	(2)
> 2 ppm but < 5 ppm	(adequate to support biodegradation)	2 wells	(2)
> 5 ppm	(ideal for biodegradation)	33 wells	(40)

Note- one well (MW-42 S) is blocked and therefore is not included in the 2016 count.

For comparison, the number of wells in each category in 2015 is presented in parentheses. As can be seen from these data, the oxygen levels in the wells are lower than they were in 2015 but are consistent with the levels experienced in 2014 and earlier. The measured levels show that there are sufficient dissolved oxygen levels in most of the wells and that the injection system is operating as designed. No well rehabilitation is needed or planned for 2017.

As expected, the oxygen levels in the new sentry wells were all observed to be 0 ppm, except for MW-70 I which had 3.1 ppm. These results indicate that almost all of the oxygen available for natural biodegradation upgradient of the biosparge system along the main axis of the JIS plume has been consumed by the time the JIS plume reaches these wells. Therefore, the biosparge system is providing the necessary oxygen for the aerobic degradation cycle to continue as the groundwater passes through the biosparge system.

### Maintenance

The only maintenance that was performed on the biosparge system in 2016 was the routine maintenance of the compressor and injection system.

Recommendations for 2017 operations include continued monitoring of the oxygen distribution pattern to maintain the oxygen levels along the injection boundary. Appropriate maintenance or adjustments to the injection pattern will be made as needed to optimize the distribution of oxygen.



## **2.2 Biennial Groundwater Monitoring Program**

In accordance with the November 17, 2015 approval of the reduced frequency of monitoring of the plume monitoring wells, the JIS Group did not collect any samples from the regional downgradient area of the plume in 2016. The next biennial monitoring event will be conducted in March 2017 to provide the information necessary to complete the recertification of the Classification Exception Area, which is scheduled for May 2017. The 2017 Annual Report will summarize the biennial program data similar to the 2015 Annual Report. A plot of the areas where exceedances of the NJGWQS exist based on the most recent available sampling event for each well location is presented in Figure 9. Figures 10 through 12 provide similar plots of the exceedances of the NJGWQS for the most recently collected samples for the shallow, intermediate, and deep zones of the aquifer, respectively.

## **2.3 Soil Vapor Intrusion Assessment**

In accordance with the USEPA approved “Vapor Intrusion Sampling Plan” (CRA - August 2011), an annual assessment of the potential for soil vapor intrusion is performed at and around the JIS Landfill. The annual assessment uses the shallow groundwater data from monitoring wells included in the following groundwater monitoring programs to complete the assessment:

- The biennial groundwater monitoring program that covers the entire JIS Plume downgradient of the Site. The most recent sampling for this component of the assessment was performed in 2015.
- The groundwater monitoring that is performed to assess the effectiveness of the biosparge injection system. The most recent sampling for this component of the assessment was performed in 2016.

The data from these shallow wells are compared to the New Jersey Groundwater Screening Levels (NJGWSLs) to determine whether there are any exceedances, and if so, what buildings are in the vicinity of the exceedances that would warrant further consideration for assessment or investigation. The assessment takes into consideration land use changes that occur from time to time that may have a bearing on where specific investigations become necessary.

Based upon the results of the 2015 sampling programs, the proposed 2016 assessment included follow up investigation at the following buildings:

- Sampling of the indoor and outdoor air within and near the JIS building.
- Sampling of the sub-slab conditions at the residence/auto body shop located at the intersection of Cranbury South River Road and Docks Corner Road; however, access has never been granted to this facility.

### **2.3.1 2016 Shallow Groundwater Sampling**

The groundwater samples and results from all of the shallow groundwater monitoring wells included in the 2016 biosparge monitoring event are shown on Figure 13 along with the most recent sampling result from the remainder of the wells in the groundwater monitoring program. The shallow sampling results are used to identify and assess off-Site area(s) of potential vapor intrusion (VI)



concern. As can be seen on the figure, none of the off-Site shallow well sampling results in 2016 exceeded the NJGWSLs. It is noted that results of the 2015 biennial program identified well MW-7S, located about 200 feet east from the Site boundary, as having a marginal exceedance of the NJGWSL for 1,4 dichlorobenzene (1,4-dichlorobenzene was detected at a concentration of 76 ppb, which is slightly above the screening level of 75 ppb). This well is scheduled for sampling in 2017.

### **2.3.2 Vadose Zone Well Sampling**

In accordance with the Remedial Action Work Plan, the vadose zone wells that were installed to monitor the soil gas quality around the biosparge injection system continue to be sampled semi-annually. The sampling program involves the use of hand held equipment to monitor the vadose zone in the seven on-Site vadose zone monitoring wells, as shown on Figure 14.

The results of the vadose zone sampling of the biosparge monitoring wells performed in 2016 are presented in Table 5. The results are consistent with previous years' data. All of the photoionization sample results are 0 ppm. Consistent with the Remedial Action Work Plan, no summa canister samples were collected in 2016 since the vapor readings in the wells were at or near background levels.

### **2.3.3 Indoor Air/Sub-Slab Vapor Assessment 2016**

The long-term monitoring program for the JIS Site includes an indoor air quality assessment component. On March 2, 2016, CRA collected an indoor air sample from within the JIS building. A sample of the outdoor air adjacent to the JIS building was also collected and analyzed. The analytical results with a comparison to the applicable NJDEP air quality criteria for these samples are presented in Table 6. None of the detected compounds in the indoor air sample exceeded the New Jersey Rapid Action Levels or the NJDEP non-residential indoor air criteria. As was experienced with previous sampling events, some compounds were detected in the indoor air within the JIS building. Most of the detected compounds (benzene, ethanol, N-heptane, and toluene) are found in petroleum-based products. Given that the office is attached to the Jones' machine and truck repair shop, it is not unexpected that vapors from such petroleum-based chemicals would be detected in the indoor air of the office.

It was also planned to collect a sub-slab vapor sample from the residence / auto body shop located to the southeast of the intersection of Cranbury South River Road and Docks Corner Road. However, permission to perform this sampling was not provided by the owner of the property. Consequently, the planned sub-slab sampling was not performed. A request will be made for access to collect these samples during the 2016/2017 winter heating season.

### **2.3.4 2016 / 2017 Sampling**

Based upon the 2016 Vapor Intrusion Assessment, the vapor intrusion sampling planned for the upcoming 2016/2017 heating season will include the following:

- Sampling of the indoor and outdoor air within and near the JIS building (It is planned to include this sampling of the JIS building in each annual event, unless the building is demolished or no longer occupied or the groundwater quality meets the NJGWSLs). Although the building is no



longer occupied now that JIS.Co. has vacated the property, the indoor air sampling will be performed at least in the 2016/2017 heating season.

- Sub-slab and outdoor air samples from beneath and near the residence/auto body shop located at the intersection of Cranbury South River Road and Docks Corner Road. A new request for access will be made to the owner of the property to address the historic presence of VOCs near this building.

Given the 2016 assessment and current land use, these are the only two buildings in the vicinity of a NJGWSL exceedance and therefore they are the only two buildings included in the planned sampling program for the coming heating season.

## **2.4 Site Maintenance**

The routine Site inspections conducted over the past year have not identified any items requiring special attention. All systems are operating / performing normally as follows:

- The air injection system operated as designed. The compressor received normal maintenance.
- The Site cap is in good condition. There were no signs of erosion and the vegetative cover is healthy. The vegetation was cut twice; once in April and again in October.
- The Site security has been upgraded. Additional sections of fence have been added to the fence that encircles the property. Fencing has been added to the north, east, and south perimeter of the property, and the entire site is now fenced. In addition, a security camera system has been installed to monitor any activity that occurs on the Site.

## **2.5 Reporting**

The JIS Group submitted the 2015 Annual Report to the USEPA on February 9, 2016. That report covered the period October 2014 through December 2015. It is planned to submit these annual reports in December/January each year in conjunction with the JIS Group's preparations for the annual vapor intrusion investigations.

# **3. Additional Activities Performed in Reporting Period**

## **3.1 Classification Exception Area**

In 2011, the JIS Group submitted a report to the NJDEP providing information on the location of the JIS plume downgradient of the Site and a list of the private properties upon which the plume is located. (The list also included private properties upon which groundwater exceeds a NJGWQS, regardless of the location from which the chemicals may have been sourced). This documentation was accepted by the NJDEP and on May 6, 2013, the NJDEP issued a letter approving the Classification Exception Area (CEA) as defined in the report. In August 2013, the JIS Group sent registered letters to the property owners, municipalities, and county health departments included in the CEA. On May 6, 2015, the JIS Group submitted the first biennial recertification of the CEA to the



NJDEP using the groundwater data collected in March 2015. The next biennial recertification of the CEA will be due in May 2017 and will be based upon data collected early in 2017. It is noted that the groundwater concentrations in the plume continue to decrease, and therefore, the JIS Group anticipates that the area included in the CEA will also decrease over time. Therefore, the JIS Group also anticipates that the number of properties that will be included in the next iteration of the CEA will also decrease. Figure 15 shows the limits of the CEA based on the most recent groundwater data including any samples collected in 2016.

## **4. Work Scheduled for the Next Reporting Period**

In the next reporting period (2017), the work to be performed will be compliant with that specified in the Remedial Action Work Plan. The following work is scheduled for the next reporting period:

- Continue to operate and maintain the biosparge treatment system.
- Continue to perform the biosparge groundwater monitoring program and the annual plume groundwater monitoring program.
- Prepare and submit a recertification for the Classification Exception Area to the New Jersey Department of Environmental Protection in May 2017 using the groundwater data collected in the spring of 2017.
- Perform the soil vapor intrusion sampling during the winter months, including access requests.
- The annual report on the year's activities will be prepared and submitted in December 2017/January 2018.
- Develop a plan for well relocation/abandonment for the Protinick property and implement the plan upon receiving USEPA approval.
- Continue to work with the property owners in the immediate vicinity of the JIS Site on an as-needed basis.
- File a new Deed Notice for the Site which includes the entire property as a restricted area. The previous Deed Notice only included the western portion of the property where the landfill is located.
- Perform a limited hydraulic study to determine the effects of precipitation on the infiltration basin and the resulting fluctuating groundwater concentrations. A work plan will be submitted to USEPA for approval prior to implementation.

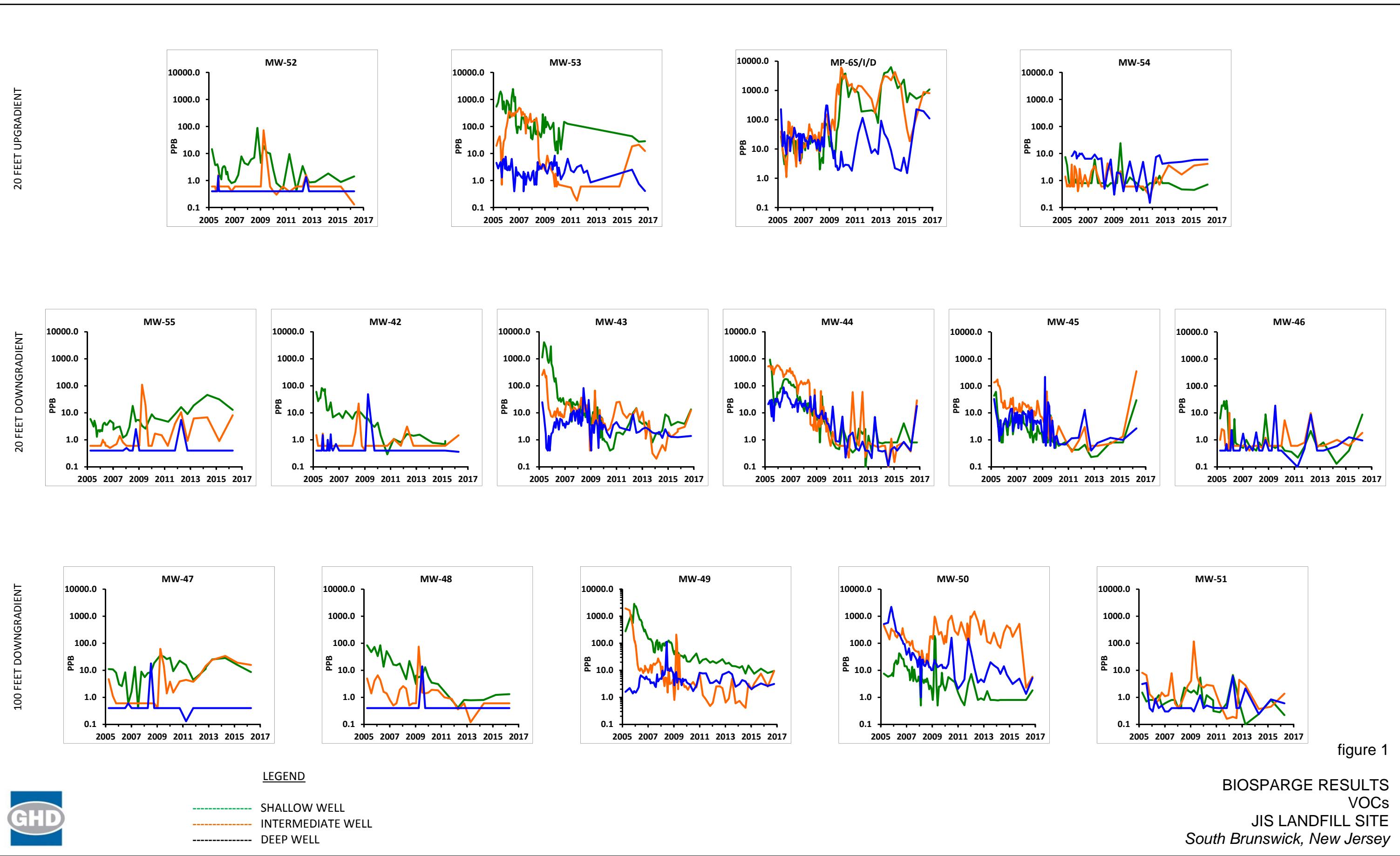
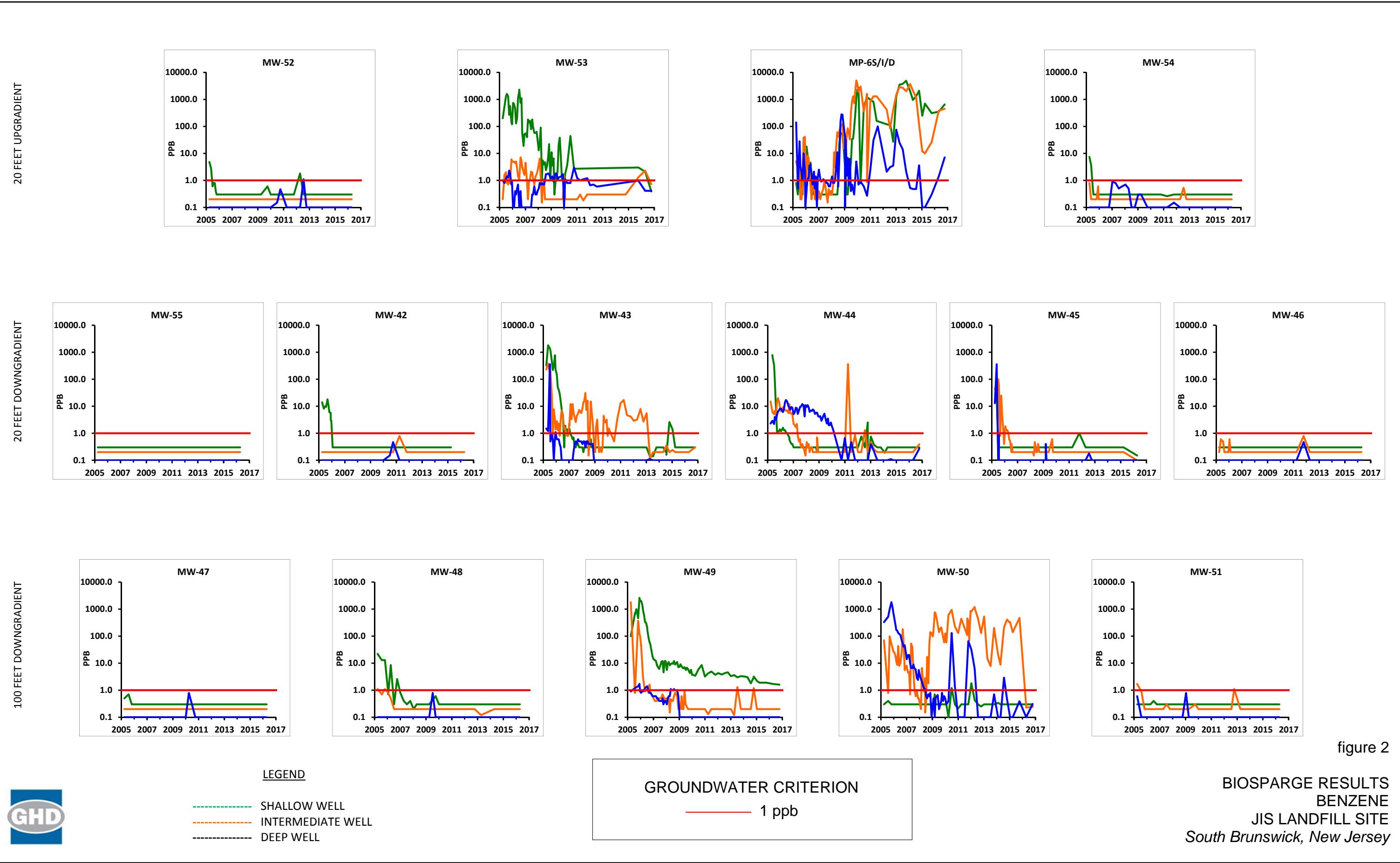


figure 1



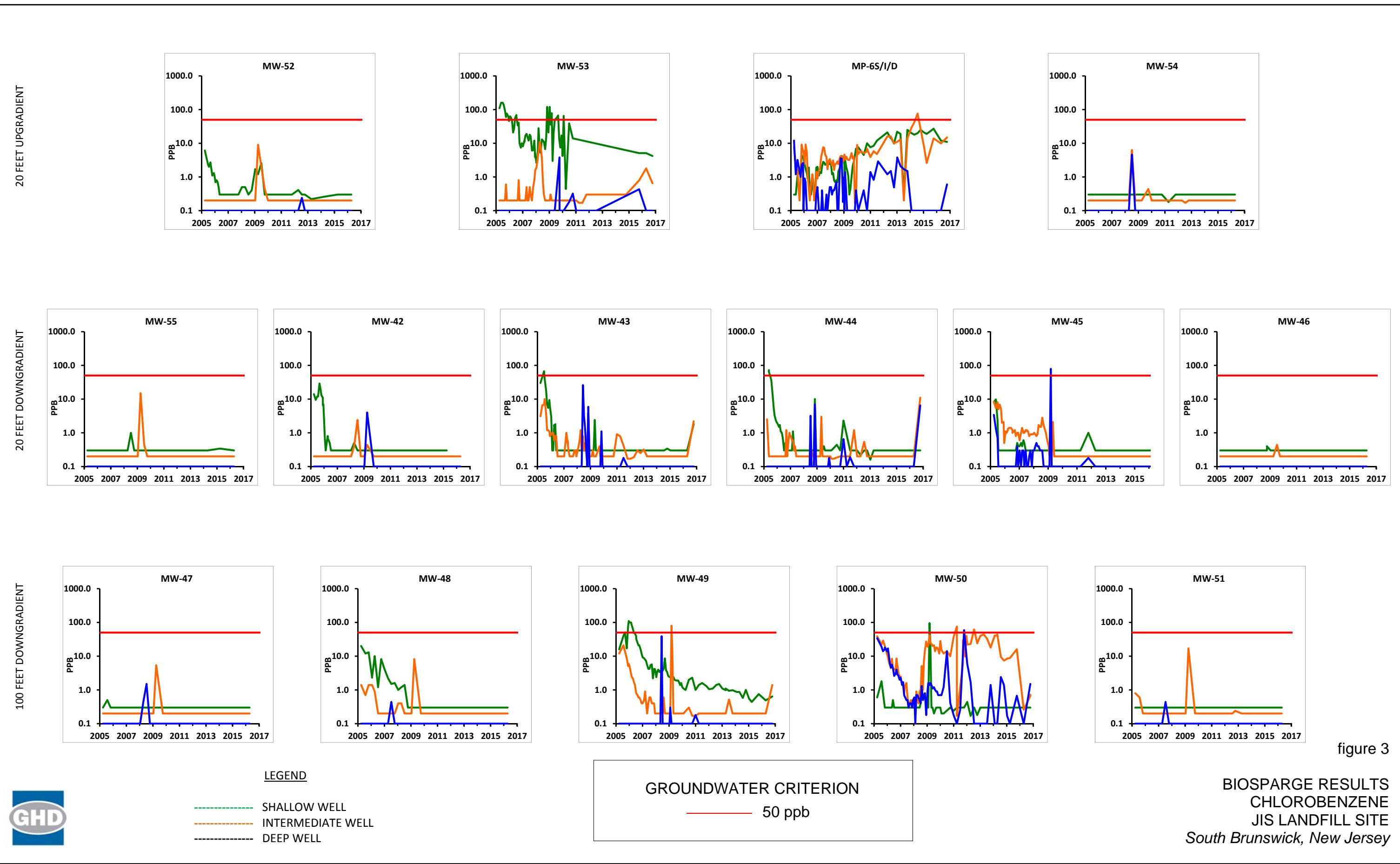


figure 3

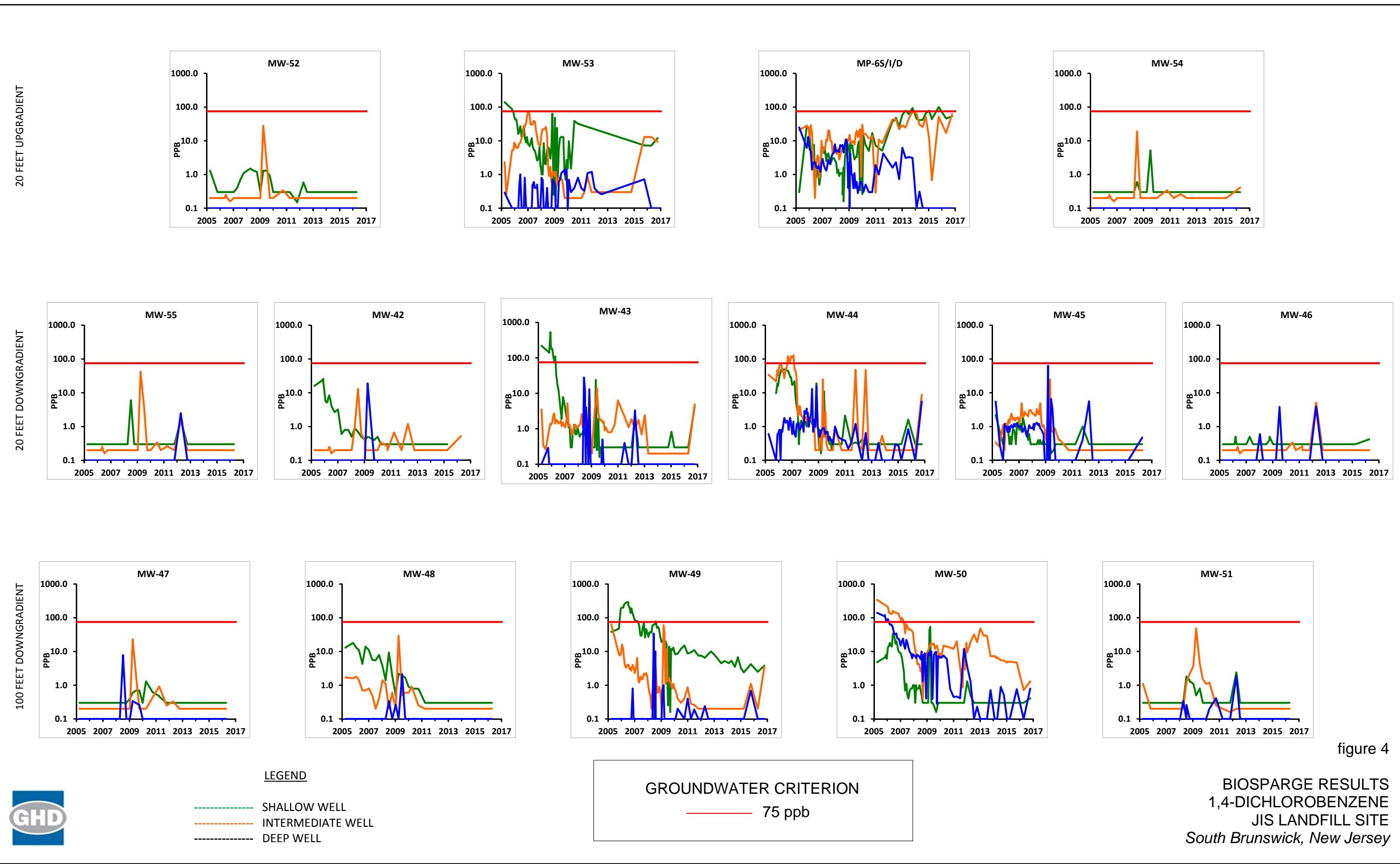
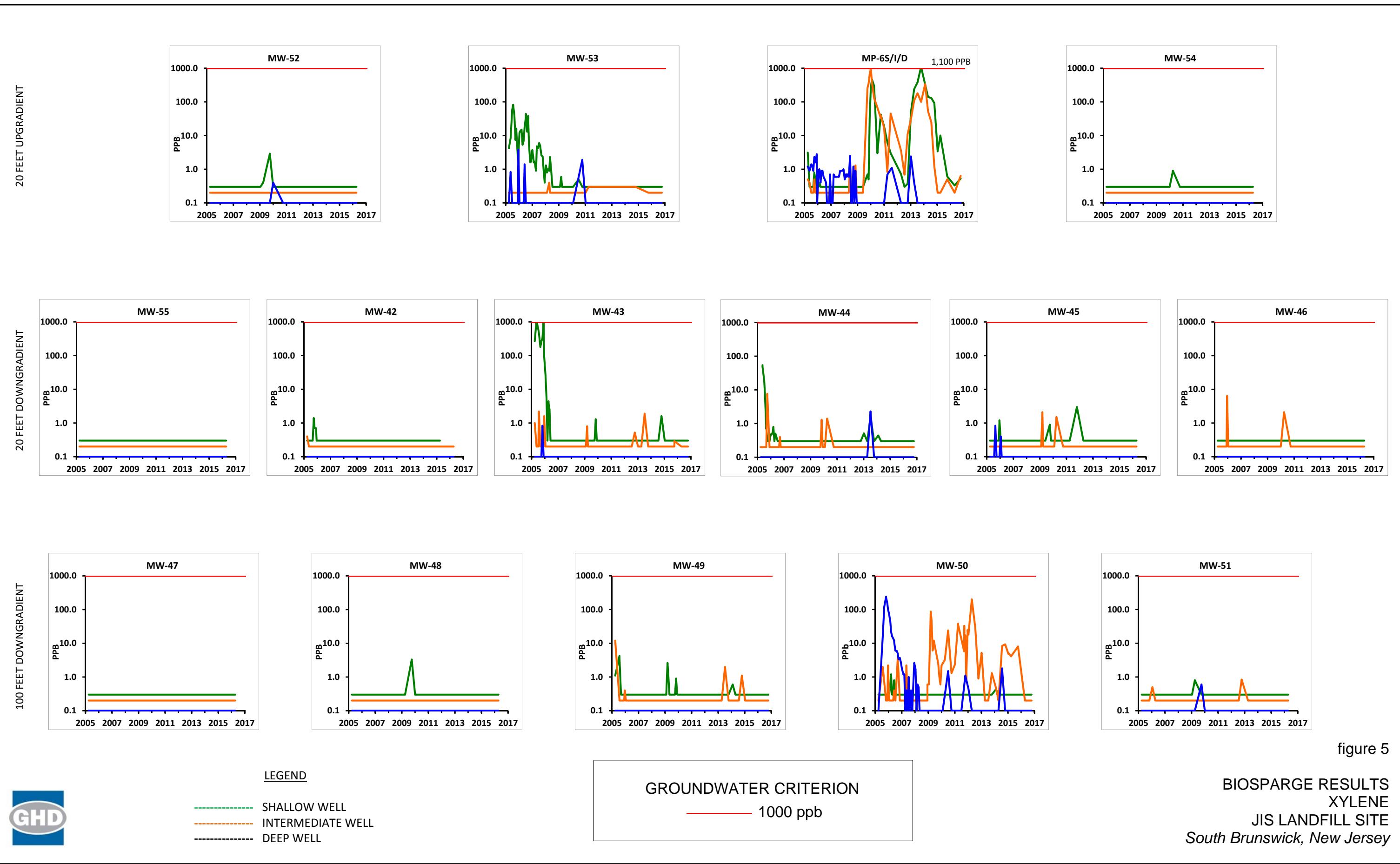


figure 4



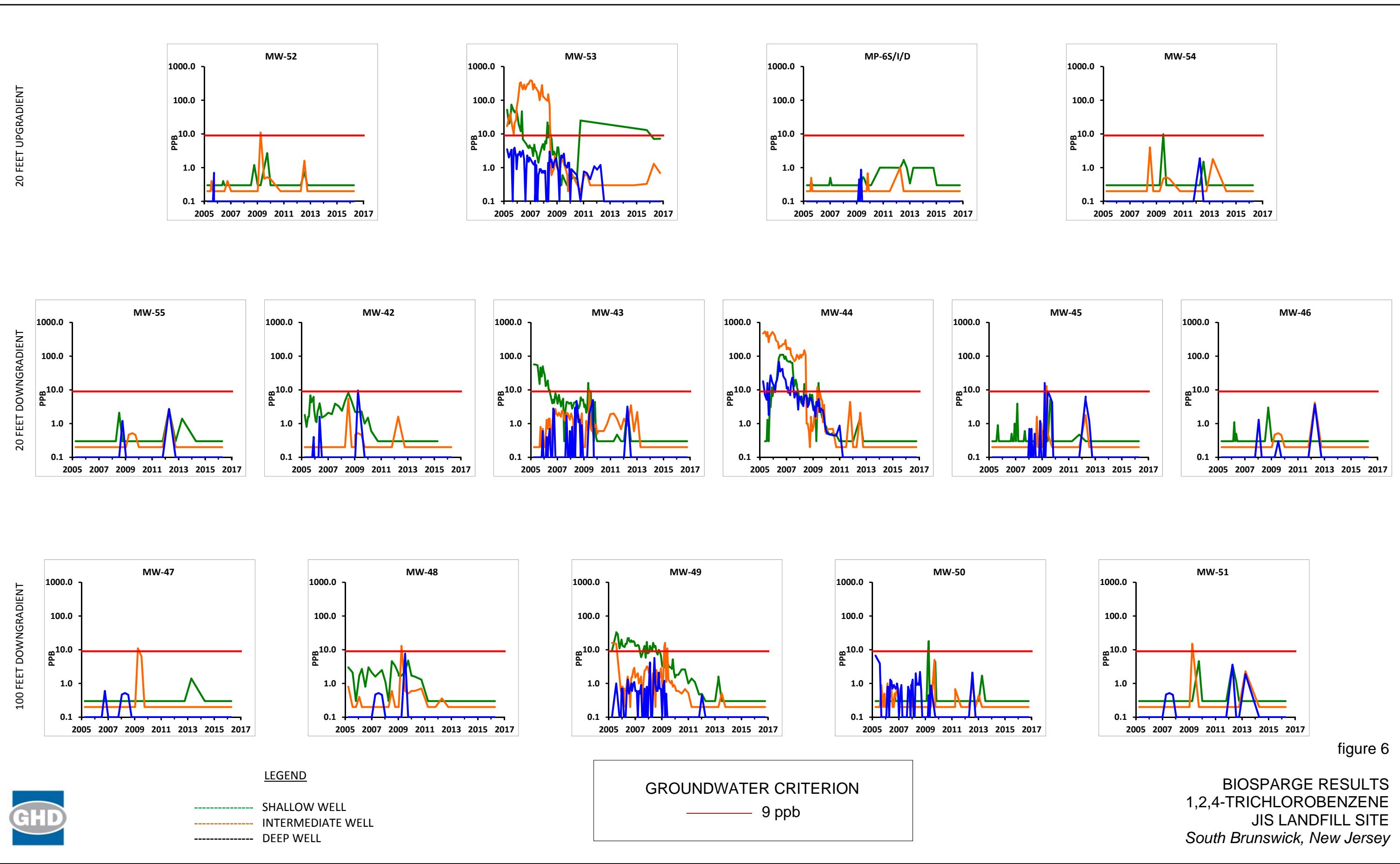
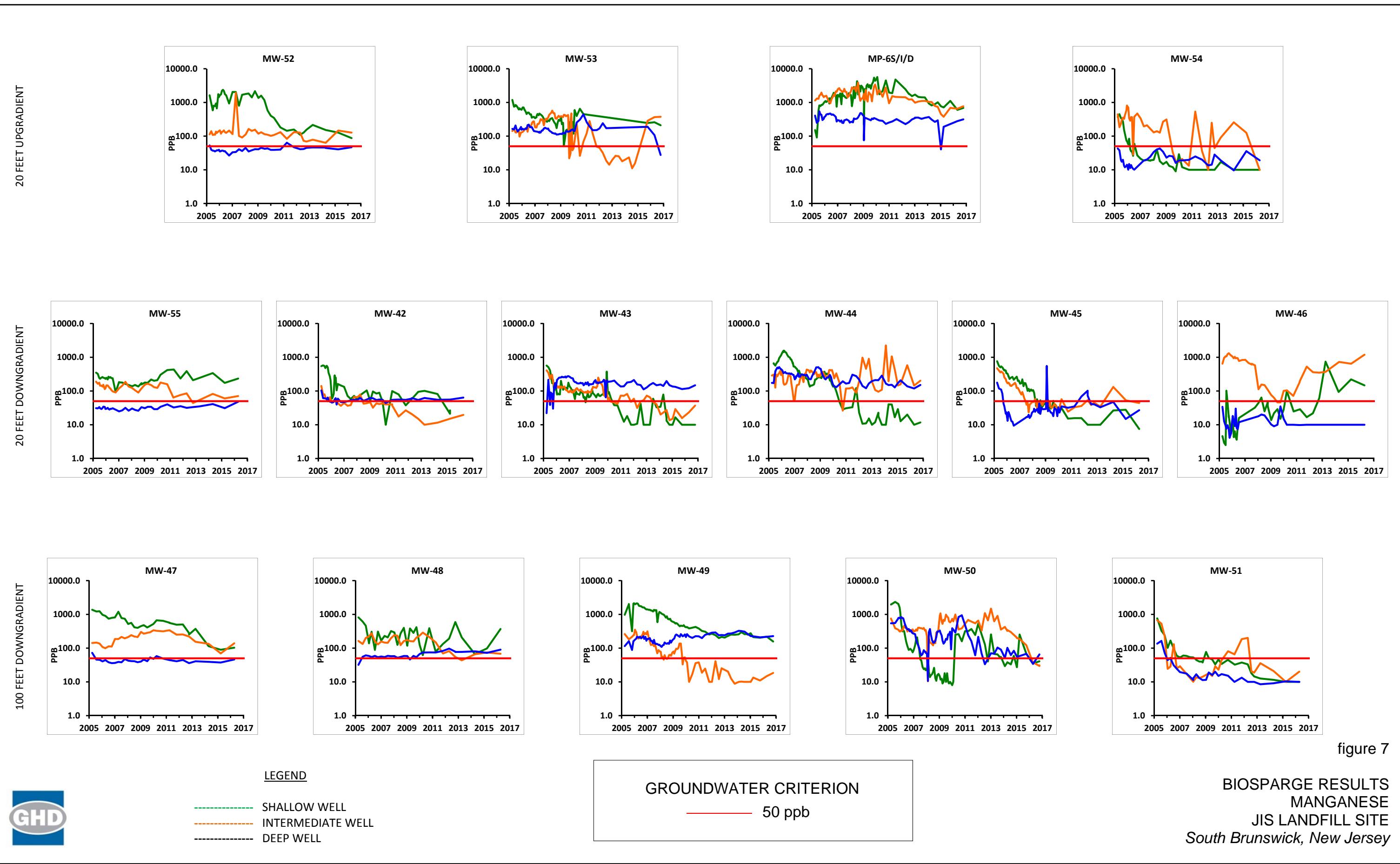
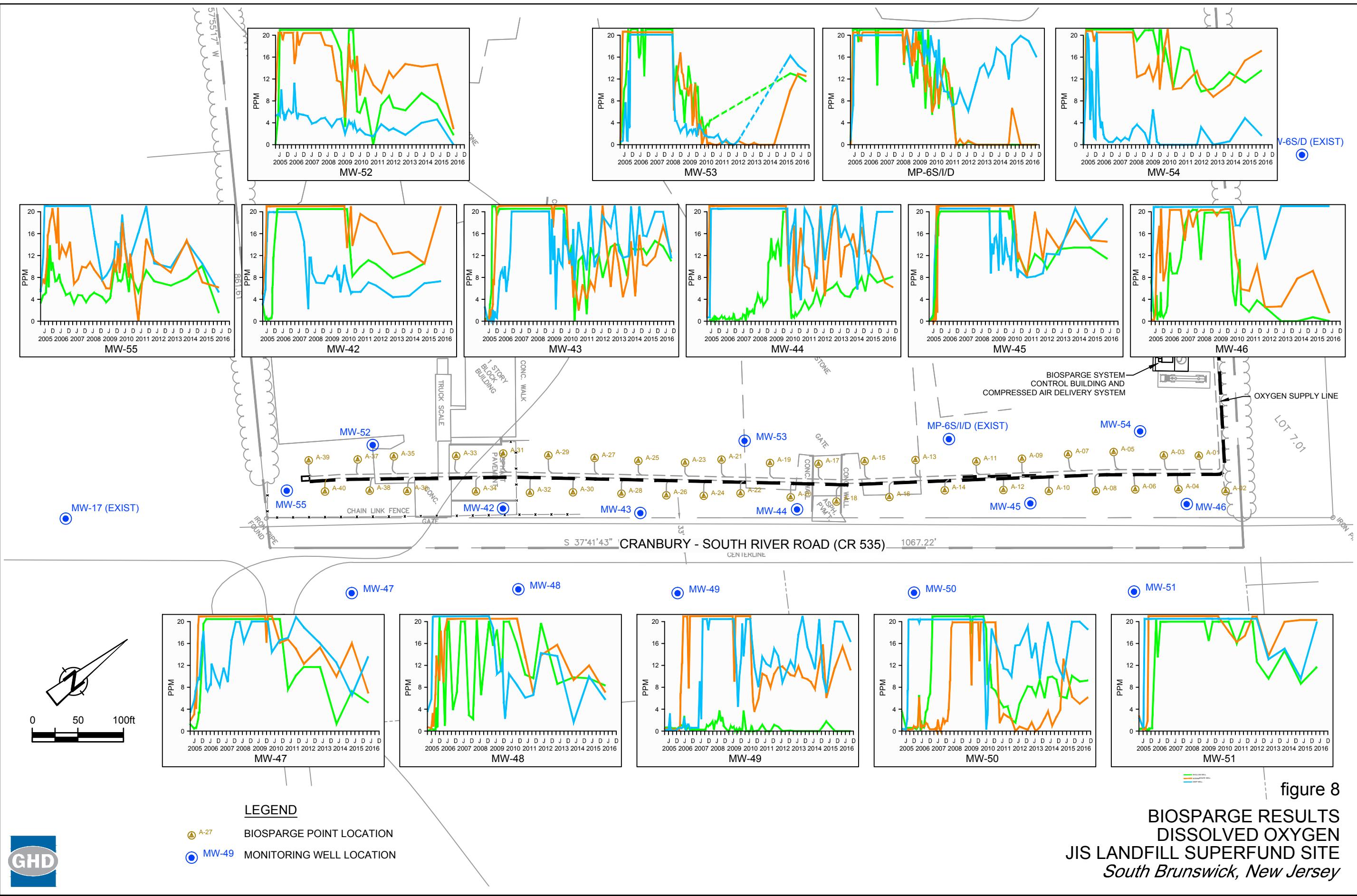


figure 6

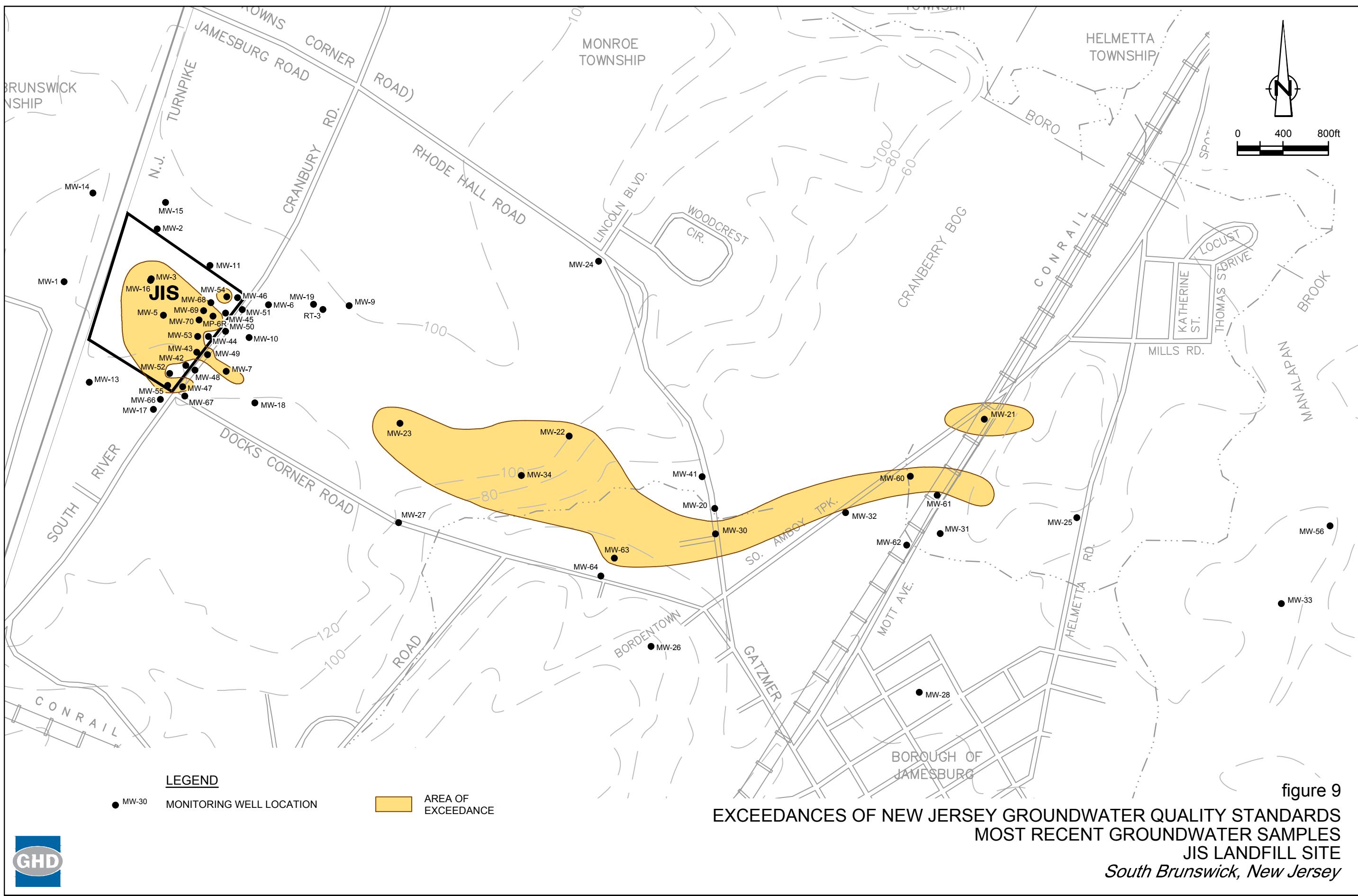




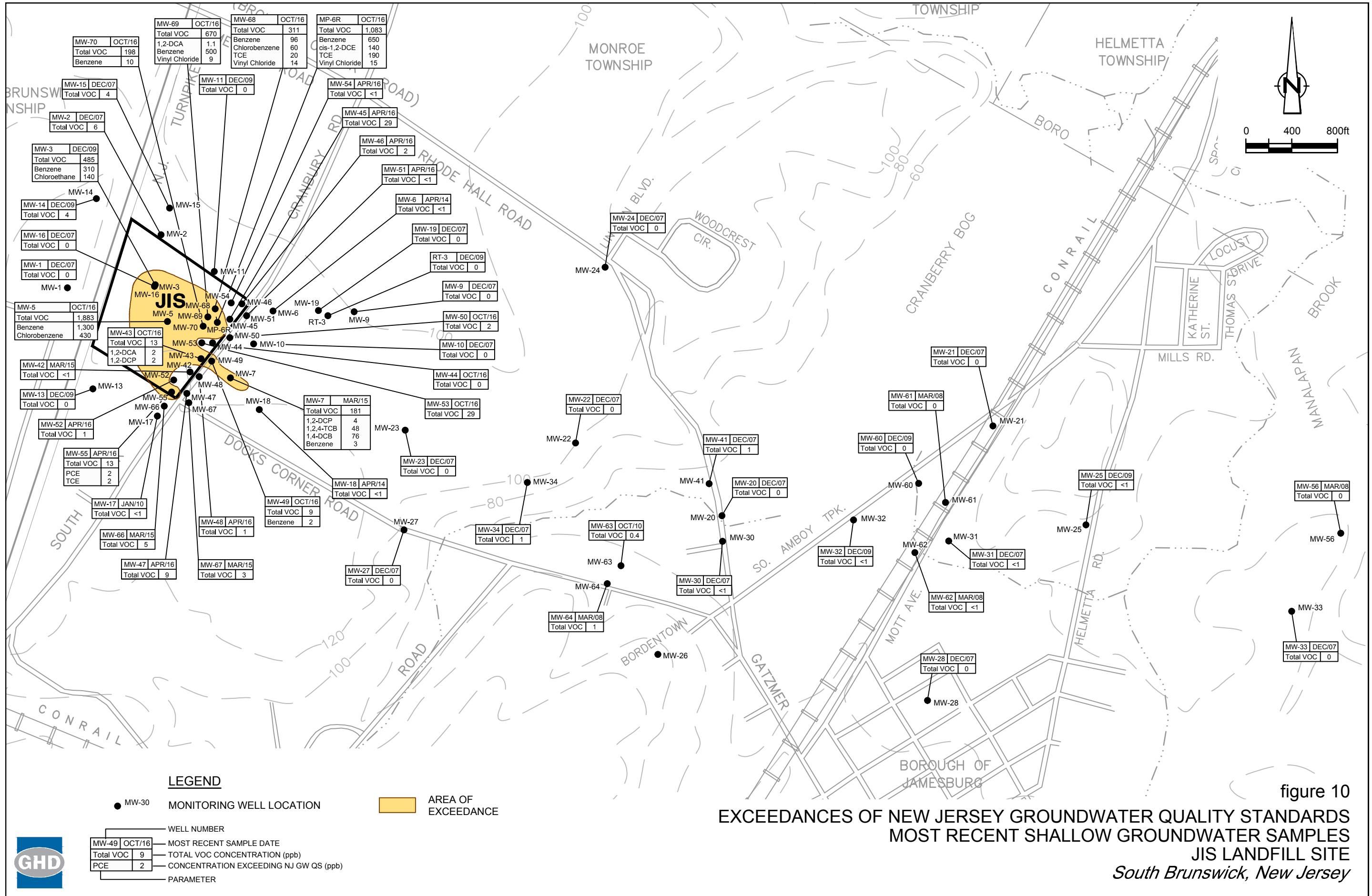
## figure 8

**BIOSPARGE RESULTS  
DISSOLVED OXYGEN  
JIS LANDFILL SUPERFUND SITE  
*South Brunswick, New Jersey***

14737-00(070)GN-WA001 DEC 12, 2016



14737-00(070)GN-WA002 DEC 7, 2016



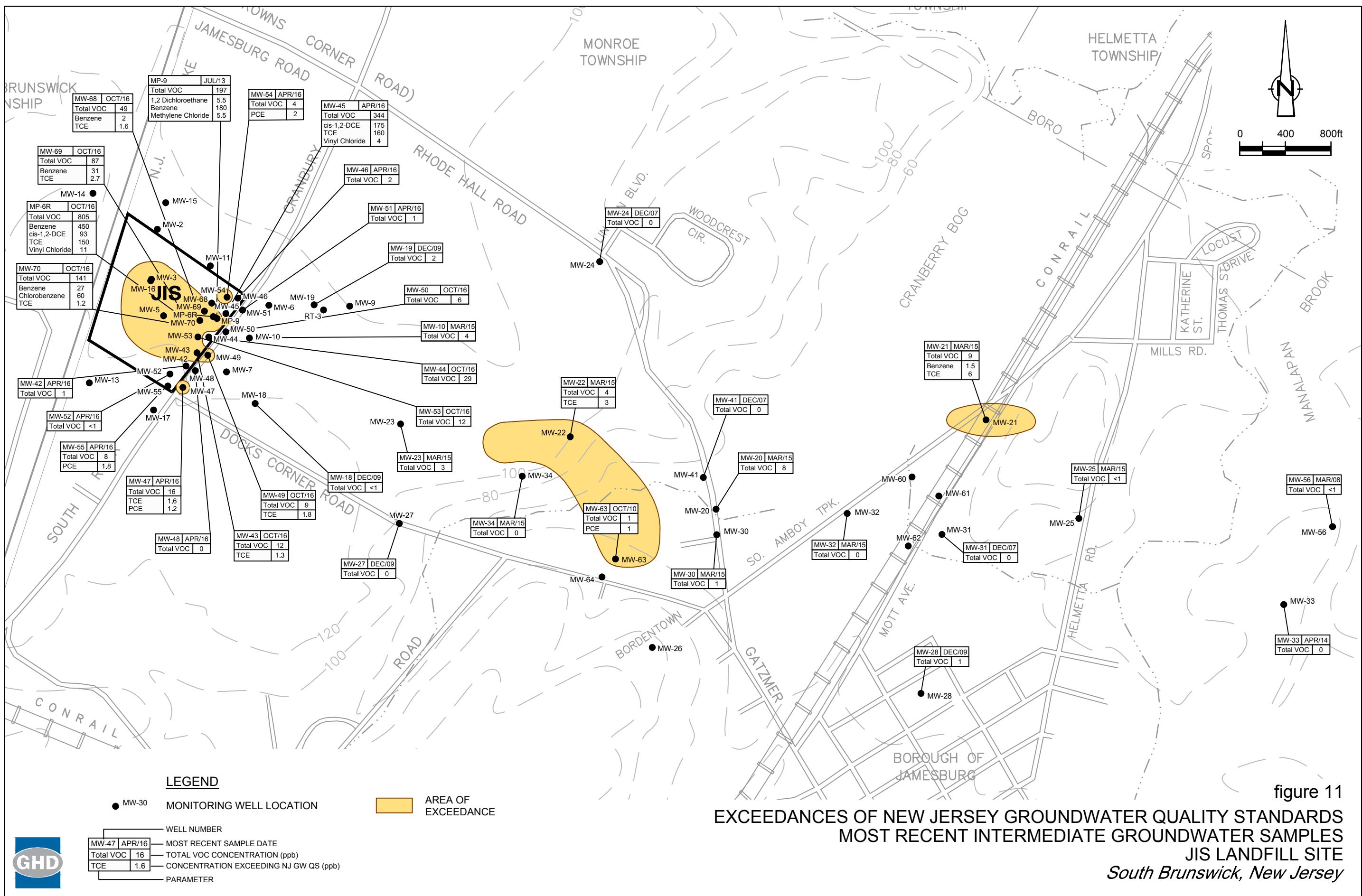


figure 11

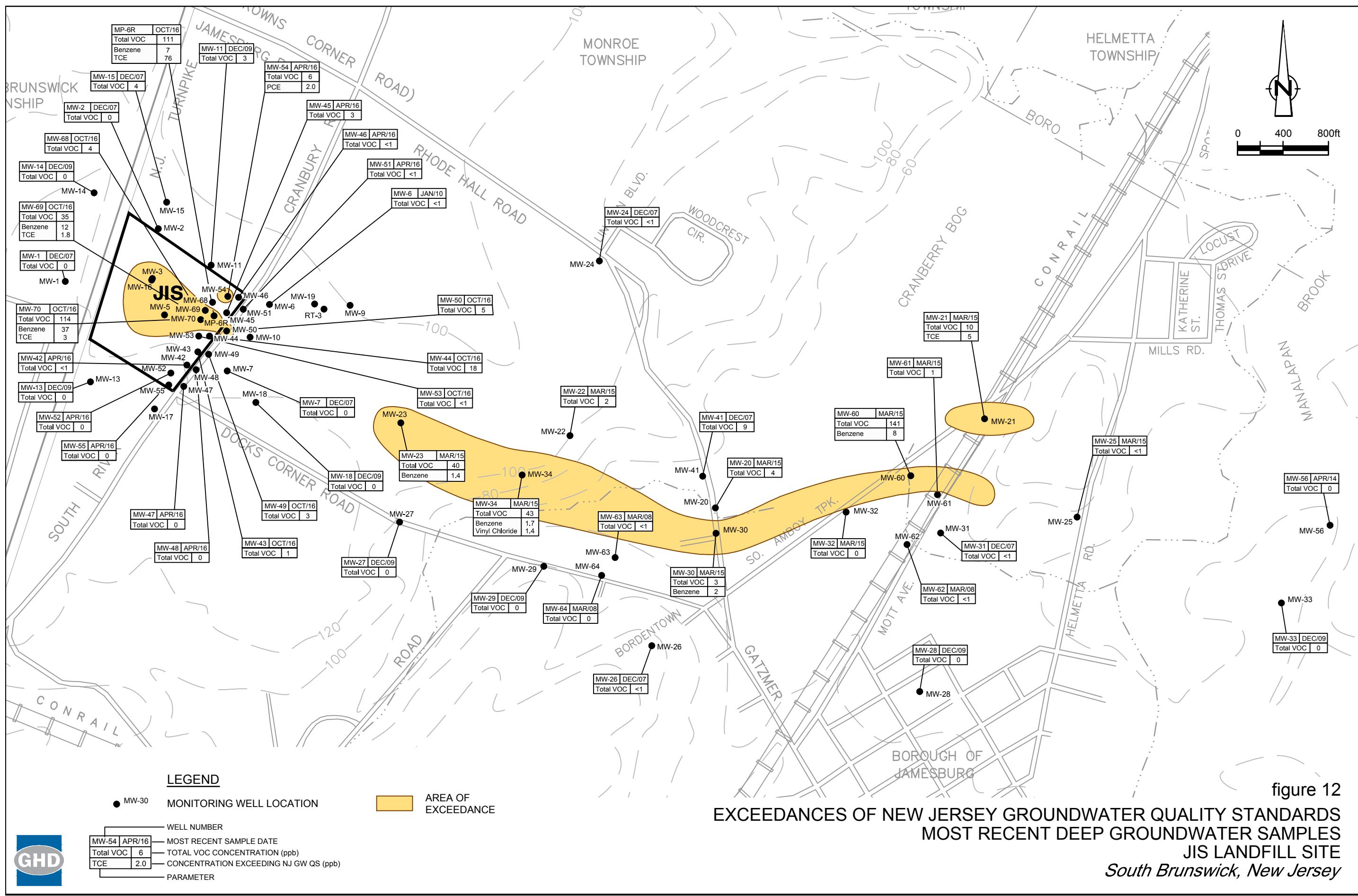


figure 12

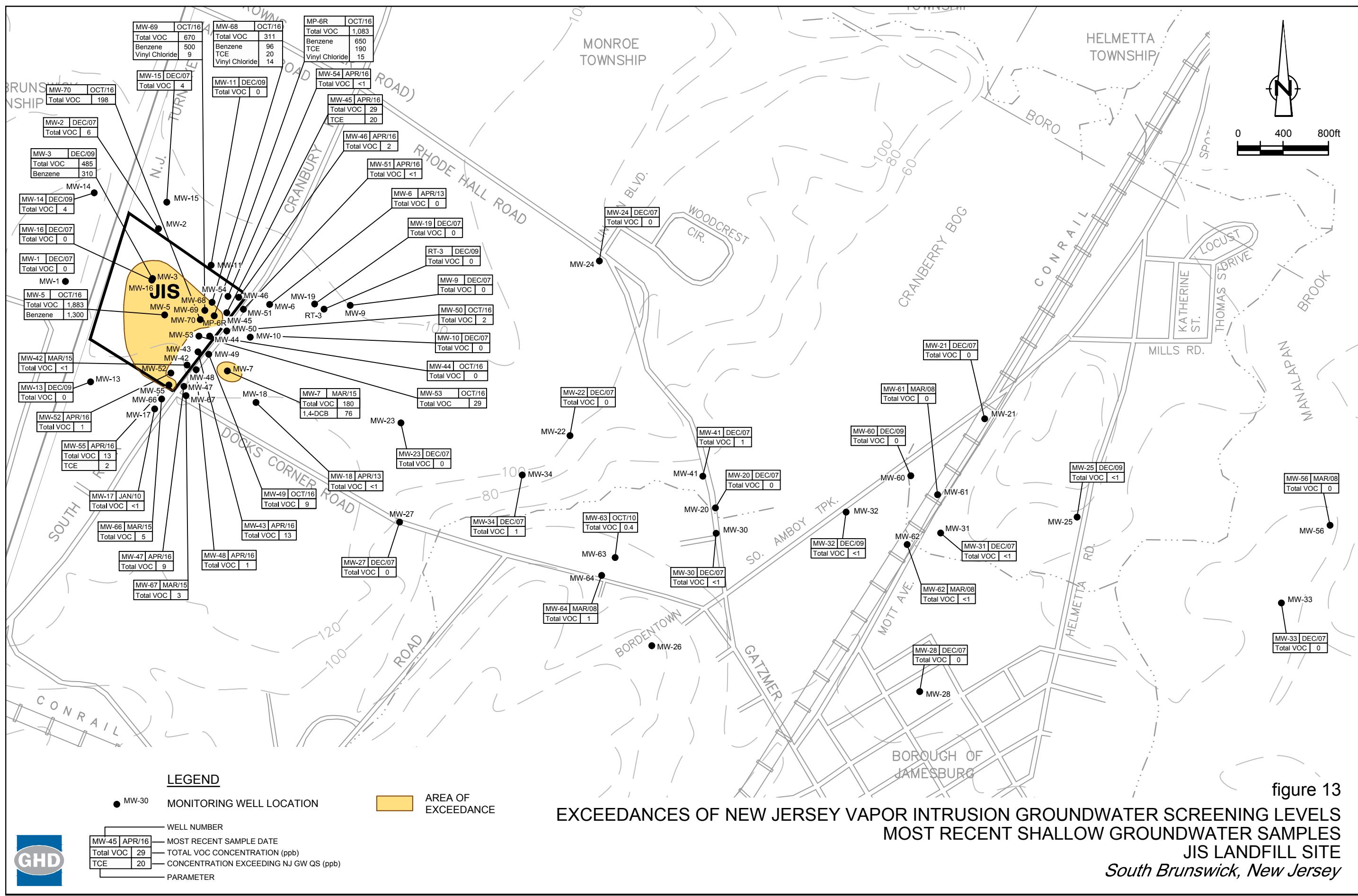


figure 13

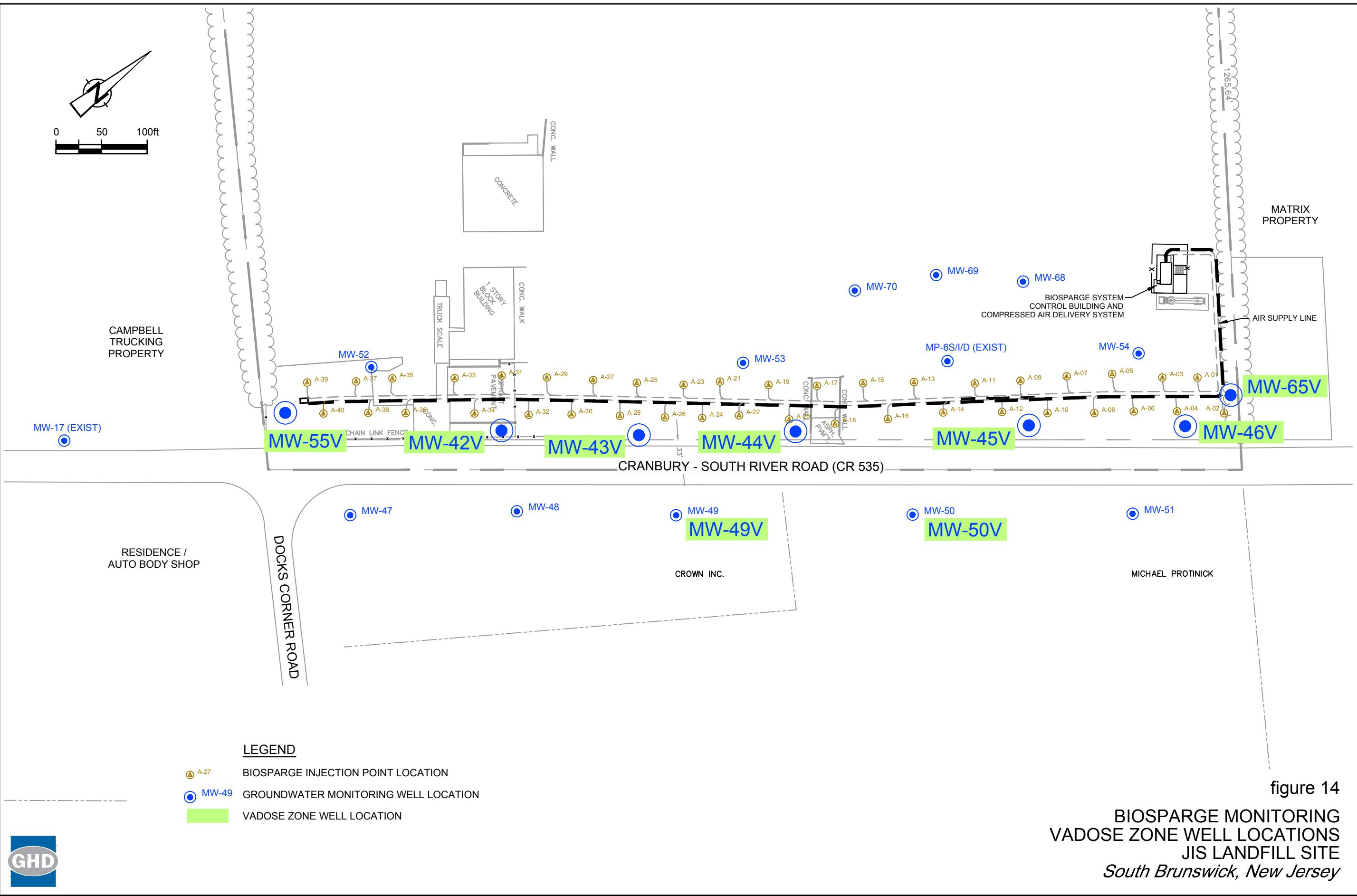


figure 14

**BIOSPARGE MONITORING  
VADOSE ZONE WELL LOCATIONS  
JIS LANDFILL SITE  
*South Brunswick, New Jersey***

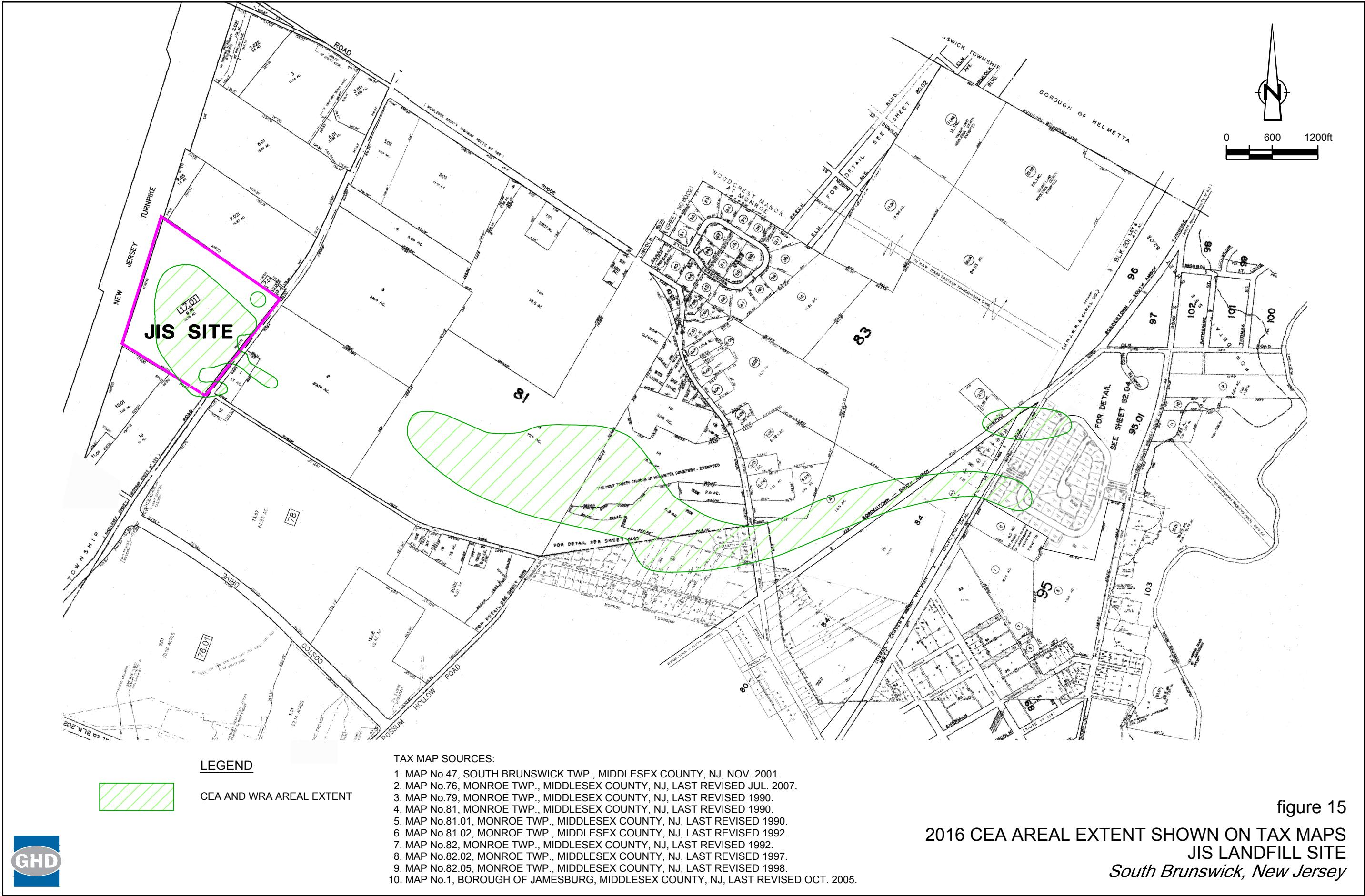


Table 1

**Groundwater Analytical Results**  
**NJGWQS Comparison**  
**JIS Landfill Site**

Sample Location: Sample Date:	NJDEP Groundwater Quality Criterion	MP-6SR 4/25/2016	MP-6SR 10/10/2016	MP-6IR 4/25/2016	MP-6IR 10/10/2016	MP-6D 4/25/2016	MP-6D 10/10/2016	MW-5 4/18/2016	MW-5 10/11/2016	MW-42I 4/12/2016	MW-42D 4/12/2016	MW-43S 4/18/2016	MW-43S 10/13/2016	
Parameters	Units													
<b>Volatiles</b>														
1,1,1-Trichloroethane	µg/L	30	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	
1,1,2-Tetrachloroethane	µg/L	1	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	
1,1,2-Trichloroethane	µg/L	3	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	
1,1-Dichloroethane	µg/L	50	0.47 J	0.52 J	0.55 J	0.60 J	0.39 J	0.35 J	1.0 UJ	1.0 U	1.0 U	1.0 U	0.35 J	
1,1-Dichloroethene	µg/L	1	0.56 J	0.60 J	1.2	0.44 J	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	
1,2,4-Trichlorobenzene	µg/L	9	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	
1,2-Dichlorobenzene	µg/L	600	0.98 J	1.2 J	0.42 J	1.3	1.0 U	1.0 U	15 J	7.8	0.95 J	1.0 U	2.5	
1,2-Dichloroethane	µg/L	2	1.0 U	0.28 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	
1,2-Dichloropropane	µg/L	1	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.7	
1,3-Dichlorobenzene	µg/L	600	4.0	4.6 J	1.5	5.2	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	5.0 U	
1,4-Dichlorobenzene	µg/L	75	46	53 J	17	62	1.0 U	1.0 U	22 J	16	0.52 J	1.0 U	4.2	
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	--	5.0 U	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	
Acetone	µg/L	6000	5.0 U	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	
Benzene	µg/L	1	350	650 J	380	450	1.4	7.1	3700	1300	1.0 U	1.0 U	1.0 U	
Bromodichloromethane	µg/L	1	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	
Bromoform	µg/L	4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	
Bromomethane (Methyl bromide)	µg/L	10	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	
Carbon tetrachloride	µg/L	1	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	
Chlorobenzene	µg/L	50	12	11 J	9.9	15	1.0 U	0.60 J	770	430	1.0 U	1.0 U	1.8	
Chloroethane	µg/L	--	11	5.8 J	11	4.9	1.6	1.9	23 J	8.3	1.0 U	1.0 U	1.0 U	
Chloroform (Trichloromethane)	µg/L	70	1.0 U	1.0 UJ	1.0 U	0.34 J	0.53 J	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	
Chloromethane (Methyl chloride)	µg/L	--	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	
cis-1,2-Dichloroethene	µg/L	70	60	140 J	66	93	58	23	1.7 J	1.0 U	1.0 U	1.0 U	1.0 U	
cis-1,3-Dichloropropene	µg/L	1	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	
Cyclohexane	µg/L	--	4.2	4.4 J	3.3	5.3	1.0 U	1.0 U	41 J	95	1.0 U	1.0 U	1.0 U	
Dibromochloromethane	µg/L	1	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	
Dichlorodifluoromethane (CFC-12)	µg/L	1000	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	
Ethylbenzene	µg/L	700	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	9.6 J	2.3	1.0 U	1.0 U	1.0 U	
Hexane	µg/L	30	1.2	0.93 J	0.70 J	0.93 J	1.0 U	1.0 U	0.58 J	1.0 U	1.0 U	1.0 U	1.0 U	
Methylene chloride	µg/L	3	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	0.60 J	1.0 U	1.0 U	1.0 U	1.0 U	
Tetrachloroethene	µg/L	1	1.0 U	1.0 UJ	1.0 U	0.73 J	0.57 J	1.0 UJ	1.0 U	1.0 U	0.36 J	1.0 U	1.0 U	
Toluene	µg/L	600	1.6	1.3 J	1.2	1.3	1.0 U	1.0 U	2.0 J	1.5	1.0 U	1.0 U	1.0 U	
trans-1,2-Dichloroethene	µg/L	100	3.2	3.7 J	3.8	3.3	1.6	0.51 J	1.0 UJ	1.0 U	1.0 U	0.20 J	0.38 J	
trans-1,3-Dichloropropene	µg/L	1	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	
Trichloroethene	µg/L	1	190	190 J	370	150	130	76	2.1 J	0.33 J	1.0 U	1.0 U	1.0 U	
Vinyl chloride	µg/L	1	9.8	15 J	15	11	1.4	1.0 U	0.073 J	1.0 U	1.0 U	1.0 U	1.0 U	
Xylenes (total)	µg/L	1000	0.33 J	0.53 J	2.0 U	0.64 J	2.0 U	2.0 U	55 J	13	2.0 U	2.0 U	2.0 U	
Total VOCs	µg/L	--	695.34	1082.84	881.57	804.91	195.46	110.56	4656.653	1882.73	1.47	0.36	3.9	13.33
<b>Metals</b>														
Arsenic	µg/L	--	7.9	10.0	10.7	9.8	8.4	4.4	13.9	13.1	2.5 U	2.5 U	1.6 J	2.5 U
Manganese	µg/L	--	602	686	651	768	279	315	597	533	19.6	63.8	10.0 U	10.0 U
<b>Field Parameters</b>														
Conductivity, field	umhos/cm	--	1290	1140	1300	1110	912	698	1940	1850	388	443	3380	3120
Dissolved oxygen (DO), field	mg/L	--	0	0.00	0	0.00	18.93	16.00	0	0.00	20 >	7.27	13.64	10.96
Ferrous iron, field	mg/L	--	5.4	3.5	5.4	6.0	3	1.0	20	21.0	0	0	0	0.0
Iron	mg/L	--	12	14.0	10.8	8.2	7.2	14.0	100	140.0	0	0	1	0.5
Oxidation reduction potential (ORP), field	millivolts	--	-96	-52	-116	-74	236	216	-108	-122	309	367	147	157
pH, field	s.u.	--	6.25	7.24	6.3	7.19	4.95	5.39	6.48	6.35	4.79	4.03	7.89	8.69
Temperature, field	Deg C	--	14.2	14.5	14.3	14.6	14.9	15.6	17.1	17.0	13.5	13.7	16.6	16.3
Turbidity, field	NTU	--	110	83	77	130	999 >	1000 >	7	19	19	17	7	36

## Notes:

&gt; - Greater than amount shown.

J - Estimated concentration.

U - Not detected at the associated reporting limit.

UJ - Not detected; associated reporting limit is estimated.

-- Not applicable.

Table 1

**Groundwater Analytical Results**  
**NJGWQS Comparison**  
**JIS Landfill Site**

Sample Location:	NJDEP Groundwater Quality Criterion	MW-43I	MW-43I	MW-43D	MW-43D	MW-44S	MW-44S	MW-44I	MW-44I	MW-44D	MW-44D	MW-45S	MW-45I	
Sample Date:		4/18/2016	10/13/2016	4/18/2016	10/13/2016	4/18/2016	10/13/2016	4/18/2016	10/13/2016	4/18/2016	10/13/2016	4/13/2016	4/13/2016	
Parameters	Units													
<b>Volatiles</b>														
1,1,1-Trichloroethane	µg/L	30	1.0 U	1.0 U	1.0 U	1.0 U								
1,1,2-Tetrachloroethane	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U								
1,1,2-Trichloroethane	µg/L	3	1.0 U	1.0 U	1.0 U	1.0 U								
1,1-Dichloroethane	µg/L	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.25 J	1.0 U	1.0 U	0.98 J	
1,1-Dichloroethene	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U								
1,2,4-Trichlorobenzene	µg/L	9	1.0 U	1.0 U	1.0 U	1.0 U								
1,2-Dichlorobenzene	µg/L	600	1.0 U	2.6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	7.5	1.0 U	4.7	1.0 U	1.0 U
1,2-Dichloroethane	µg/L	2	1.0 U	1.0 U	0.57 J									
1,2-Dichloropropane	µg/L	1	1.0 U	1.0 U	0.27 J									
1,3-Dichlorobenzene	µg/L	600	1.0 U	0.40 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.67 J	1.0 U	0.66 J	1.0 U	1.0 U
1,4-Dichlorobenzene	µg/L	75	1.0 U	4.9	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	8.8	1.0 U	5.5	1.0 U	1.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	--	5.0 U	5.0 U	5.0 U	5.0 U								
Acetone	µg/L	6000	5.0 U	5.0 U	5.0 U	5.0 U								
Benzene	µg/L	1	1.0 U	0.30 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.39 J	1.0 U	0.27 J	0.15 J	0.099 J
Bromodichloromethane	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U								
Bromoform	µg/L	4	1.0 U	1.0 U	1.0 U	1.0 U								
Bromomethane (Methyl bromide)	µg/L	10	1.0 U	1.0 U	1.0 U	1.0 U								
Carbon tetrachloride	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U								
Chlorobenzene	µg/L	50	1.0 U	2.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	11	1.0 U	6.5	1.0 U	1.0 U
Chloroethane	µg/L	--	1.0 U	1.0 U	1.0 U	1.0 U								
Chloroform (Trichloromethane)	µg/L	70	1.0 U	1.0 U	1.0 U	1.0 U								
Chloromethane (Methyl chloride)	µg/L	--	1.0 U	1.0 U	1.0 U	1.0 U								
cis-1,2-Dichloroethene	µg/L	70	0.43 J	0.30 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.37 J	0.40 J	1.0 U	1.0 U	9.0
cis-1,3-Dichloropropene	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U								
Cyclohexane	µg/L	--	1.0 U	1.0 U	1.0 U	1.0 U								
Dibromochloromethane	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U								
Dichlorodifluoromethane (CFC-12)	µg/L	1000	1.0 U	1.0 U	1.0 U	1.0 U								
Ethylbenzene	µg/L	700	1.0 U	1.0 U	1.0 U	1.0 U								
Hexane	µg/L	30	1.0 U	1.0 U	1.0 U	1.0 U								
Methylene chloride	µg/L	3	1.0 U	1.0 U	1.0 U	1.0 U								
Tetrachloroethene	µg/L	1	0.80 J	0.40 J	0.80 J	0.78 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.29 J	0.54 J
Toluene	µg/L	600	1.0 U	1.0 U	1.0 U	1.0 U								
trans-1,2-Dichloroethene	µg/L	100	1.0 U	1.0 U	1.0 U	0.19 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.84 J
trans-1,3-Dichloropropene	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U								
Trichloroethene	µg/L	1	1.8	1.3	0.52 J	0.42 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.39 J	20	160
Vinyl chloride	µg/L	1	1.0 U	1.0 U	4.3									
Xylenes (total)	µg/L	1000	2.0 U	2.0 U	2.0 U	2.0 U								
Total VOCs	µg/L	--	3.03	12.4	1.32	1.39	ND	ND	0.37	29.01	ND	18.02	29.44	348.699
<b>Metals</b>														
Arsenic	µg/L	--	2.5 U	2.5 U	2.5 U	2.5 U								
Manganese	µg/L	--	23.2	37.0	121	148	10.0 U	11.7	145	202	119	151	7.5 J	44.2
<b>Field Parameters</b>														
Conductivity, field	umhos/cm	--	900	501	704	577	1580	1330	1380	1120	544	594	1330	846
Dissolved oxygen (DO), field	mg/L	--	17.32	12.61	20 >	11.47	7.64	8.13	7.04	6.17	20 >	20 >	11.38	18.77
Ferrous iron, field	mg/L	--	0.6	0.8	0	0.0	0	0.0	0	0	0	0	0	0
Iron	mg/L	--	3	2.5	2.8	1.8	2	1.6	1	1.8	1.2	1.4	1.2	1.5
Oxidation reduction potential (ORP), field	millivolts	--	207	166	306	286	123	93	164	125	370	368	173	219
pH, field	s.u.	--	10.19	6.82	4.56	5.12	7.08	7.01	6.17	6.35	3.48	3.56	7.38	5.93
Temperature, field	Deg C	--	16.2	15.6	16.2	16.5	16.2	16.4	16.6	16.4	16.5	15.8	14.5	14.5
Turbidity, field	NTU	--	36	92	53	85	7	24	13	9	23	26	22	14

Notes:

&gt; - Greater than amount shown.

J - Estimated concentration.

U - Not detected at the associated reporting limit.

U - Not detected; associated reporting limit is estimated.

-- Not applicable.

Table 1

**Groundwater Analytical Results**  
**NJGWQS Comparison**  
**JIS Landfill Site**

Sample Location:		MW-45I 4/13/2016	MW-45D 4/13/2016	MW-46S 4/13/2016	MW-46I 4/13/2016	MW-46D 4/13/2016	MW-47S 4/14/2016	MW-47I 4/14/2016	MW-47D 4/14/2016	MW-48S 4/15/2016	MW-48I 4/15/2016	MW-48D 4/15/2016	MW-49S 4/15/2016	
Sample Date:		NJDEP Groundwater Duplicate												
Parameters	Units	Quality Criterion												
<b>Volatiles</b>														
1,1,1-Trichloroethane	µg/L	30	1.0 U	1.0 U										
1,1,2-Tetrachloroethane	µg/L	1	1.0 U	1.0 U										
1,1,2-Trichloroethane	µg/L	3	1.0 U	0.18 J	1.0 U	1.0 U	1.0 U	1.0 U						
1,1-Dichloroethane	µg/L	50	0.99 J	1.0 U	1.0 U									
1,1-Dichloroethene	µg/L	1	1.0 U	1.0 U										
1,2,4-Trichlorobenzene	µg/L	9	1.0 U	1.0 U										
1,2-Dichlorobenzene	µg/L	600	1.0 U	0.94 J	1.1	1.0 U	0.47 J							
1,2-Dichloroethane	µg/L	2	0.65 J	1.0 U	0.37 J	1.0 U	1.0 U	0.42 J						
1,2-Dichloropropane	µg/L	1	0.31 J	1.0 U	1.0 U	1.0 U	1.0 U	0.44 J	1.0 U	1.0 U	0.63 J	1.0 U	1.0 U	0.24 J
1,3-Dichlorobenzene	µg/L	600	1.0 U	1.0 U										
1,4-Dichlorobenzene	µg/L	75	1.0 U	0.47 J	0.42 J	1.0 U	2.5							
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	--	5.0 U	5.0 U										
Acetone	µg/L	6000	5.0 U	5.0 U										
Benzene	µg/L	1	0.10 J	1.0 U	1.7									
Bromodichloromethane	µg/L	1	1.0 U	1.0 U										
Bromoform	µg/L	4	1.0 U	1.0 U										
Bromomethane (Methyl bromide)	µg/L	10	1.0 U	1.0 U										
Carbon tetrachloride	µg/L	1	1.0 U	1.0 U										
Chlorobenzene	µg/L	50	1.0 U	0.49 J										
Chloroethane	µg/L	--	1.1	1.0 U	1.0 U									
Chloroform (Trichloromethane)	µg/L	70	1.0 U	1.0 U										
Chloromethane (Methyl chloride)	µg/L	--	1.0 U	1.0 U										
cis-1,2-Dichloroethene	µg/L	70	170	1.0 U	1.0 U	1.0 U	1.0 U	7.2	13	1.0 U	1.0 U	1.0 U	1.0 U	1.3
cis-1,3-Dichloropropene	µg/L	1	1.0 U	1.0 U										
Cyclohexane	µg/L	--	1.0 U	1.0 U										
Dibromochloromethane	µg/L	1	1.0 U	1.0 U										
Dichlorodifluoromethane (CFC-12)	µg/L	1000	1.0 U	0.25 J	1.0 U	1.3	0.22 J	1.0 U	1.0 U					
Ethylbenzene	µg/L	700	1.0 U	1.0 U										
Hexane	µg/L	30	1.0 U	1.0 U										
Methylene chloride	µg/L	3	1.0 U	1.0 U										
Tetrachloroethene	µg/L	1	0.53 J	0.99 J	1.0 U	0.52 J	0.73 J	0.31 J	1.2	1.0 U	0.13 J	1.0 U	1.0 U	1.0 U
Toluene	µg/L	600	1.0 U	1.0 U										
trans-1,2-Dichloroethene	µg/L	100	0.74 J	1.0 U	1.0 U									
trans-1,3-Dichloropropene	µg/L	1	1.0 U	1.0 U										
Trichloroethene	µg/L	1	160	1.0 U	0.44 J	1.0 U	1.0 U	0.68 J	1.6	1.0 U	1.0 U	1.0 U	1.0 U	0.40 J
Vinyl chloride	µg/L	1	4.1	1.0 U	0.43 J									
Xylenes (total)	µg/L	1000	2.0 U	2.0 U										
Total VOCs	µg/L	--	338.52	2.65	1.96	1.82	0.95	8.63	15.8	ND	1.31	ND	ND	7.95
<b>Metals</b>														
Arsenic	µg/L	--	2.5 U	2.1 J	2.5 U	2.5 U	2.5 U	4.6						
Manganese	µg/L	--	47.9	27.0	147	1190	10.0 U	103	139	46.1	369	68.1	90.1	219
<b>Field Parameters</b>														
Conductivity, field	umhos/cm	--	--	1240	1020	1340	813	541	656	152	802	999	550	2400
Dissolved oxygen (DO), field	mg/L	--	--	14.5	0	1.5	20 >	5.18	6.92	13.62	8.3	7.07	5.74	0
Ferrous iron, field	mg/L	--	--	0	0	0	0	0	0	2	1	0	4.2	
Iron	mg/L	--	--	1.4	0.8	1	0	2	0	12	5	3.2	1	12
Oxidation reduction potential (ORP), field	millivolts	--	--	190	-62	122	222	211	280	371	209	206	386	-164
pH, field	s.u.	--	--	6.57	7.27	6.24	5.74	7.08	6.03	5.00	5.57	6.09	3.79	7.04
Temperature, field	Deg C	--	--	14.9	14.0	14.4	14.1	14.7	14.7	15.4	14.6	14.3	14.1	15.4
Turbidity, field	NTU	--	--	15	29	15	22	57	17	999 >	88	34	26	11

Notes:

&gt; - Greater than amount shown.

J - Estimated concentration.

U - Not detected at the associated reporting limit.

U - Not detected; associated reporting limit is estimated.

-- Not applicable.

Table 1

**Groundwater Analytical Results**  
**NJGWQS Comparison**  
**JIS Landfill Site**

Sample Location:		MW-49S NJDEP Groundwater Quality Criterion	MW-49I 10/13/2016 4/15/2016	MW-49I 10/13/2016 4/15/2016	MW-49D 10/13/2016 4/15/2016	MW-49D 10/13/2016 4/14/2016	MW-50S 10/13/2016 4/14/2016	MW-50S 10/13/2016 4/14/2016	MW-50I 10/13/2016 4/14/2016	MW-50I 10/13/2016 4/14/2016	MW-50I 10/13/2016 Duplicate	MW-50D 10/13/2016 4/14/2016
<b>Parameters</b>												
<b>Volatiles</b>												
1,1,1-Trichloroethane	µg/L	30	1.0 U									
1,1,2-Tetrachloroethane	µg/L	1	1.0 U									
1,1,2-Trichloroethane	µg/L	3	1.0 U	0.13 J	1.0 U	0.23 J	0.45 J	1.0 U				
1,1-Dichloroethane	µg/L	50	1.0 U	1.4	1.0 U	0.36 J	0.40 J					
1,1-Dichloroethene	µg/L	1	1.0 U									
1,2,4-Trichlorobenzene	µg/L	9	1.0 U									
1,2-Dichlorobenzene	µg/L	600	0.73 J	1.0 U	1.7	1.0 U	1.0 U	1.0 U	0.70 J	0.75 J	0.29 J	1.0 U
1,2-Dichloroethane	µg/L	2	0.40 J	1.0 U	1.0 U	0.49 J	0.43 J	1.0 U	1.0 U	0.28 J	0.29 J	1.0 U
1,2-Dichloropropane	µg/L	1	0.36 J	1.0 U	1.0 U	1.0 U	0.23 J	1.0 U				
1,3-Dichlorobenzene	µg/L	600	1.0 U	0.33 J	1.0 U	0.39 J	0.43 J					
1,4-Dichlorobenzene	µg/L	75	3.8	1.0 U	3.5	1.0 U	1.0 U	0.41 J	0.73 J	0.72 J	1.3	1.3
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	--	5.0 U									
Acetone	µg/L	6000	5.0 U									
Benzene	µg/L	1	1.6	1.0 U	0.25 J	0.23 J	0.24 J	0.28 J				
Bromodichloromethane	µg/L	1	1.0 U									
Bromoform	µg/L	4	1.0 U									
Bromomethane (Methyl bromide)	µg/L	10	1.0 U									
Carbon tetrachloride	µg/L	1	1.0 U									
Chlorobenzene	µg/L	50	0.64 J	1.0 U	1.4	1.0 U	1.0 U	1.0 U	0.26 J	0.26 J	0.66 J	0.72 J
Chloroethane	µg/L	--	1.0 U	2.0	2.0	1.0 U						
Chloroform (Trichloromethane)	µg/L	70	1.0 U									
Chloromethane (Methyl chloride)	µg/L	--	1.0 U									
cis-1,2-Dichloroethene	µg/L	70	0.51 J	0.67 J	0.67 J	0.27 J	0.29 J	1.0 U				
cis-1,3-Dichloropropene	µg/L	1	1.0 U									
Cyclohexane	µg/L	--	0.47 J	1.0 U								
Dibromochloromethane	µg/L	1	1.0 U									
Dichlorodifluoromethane (CFC-12)	µg/L	1000	1.0 U									
Ethylbenzene	µg/L	700	1.0 U									
Hexane	µg/L	30	1.0 U									
Methylene chloride	µg/L	3	1.0 U									
Tetrachloroethene	µg/L	1	1.0 U	0.20 J	0.32 J	0.87 J	0.71 J	1.0 U	1.0 U	1.0 U	1.0 U	0.14 J
Toluene	µg/L	600	1.0 U									
trans-1,2-Dichloroethene	µg/L	100	0.26 J	1.0 U	1.0 U	1.0 U	0.20 J	1.0 U	1.0 U	1.0 U	1.0 U	0.20 J
trans-1,3-Dichloropropene	µg/L	1	1.0 U									
Trichloroethene	µg/L	1	0.41 J	1.5	1.8	0.78 J	0.82 J	1.0 U	1.0 U	1.0 U	0.23 J	0.30 J
Vinyl chloride	µg/L	1	0.31 J	1.0 U								
Xylenes (total)	µg/L	1000	2.0 U									
Total VOCs	µg/L	--	9.49	2.5	9.39	2.64	3.13	ND	1.81	2.27	2.24	5.76
<b>Metals</b>												
Arsenic	µg/L	--	3.6	2.5 U	2.5 U	2.5 U	1.8 J	1.5 J	2.5 U	2.4 J	2.4 J	2.3 J
Manganese	µg/L	--	157	14.8	18.4	217	227	35.0	40.8	36.8	38.0	29.7
<b>Field Parameters</b>												
Conductivity, field	umhos/cm	--	2130	956	847	455	313	1060	1180	1620	--	1970
Dissolved oxygen (DO), field	mg/L	--	0.00	15.42	11.14	20 >	16.33	9.06	9.23	4.99	--	6.17
Ferrous iron, field	mg/L	--	3.0	0	0.0	0.6	0.0	0	0.0	1.6	--	0.2
Iron	mg/L	--	11.0	1	0.7	3.6	6.0	1.3	1.4	5	--	2.0
Oxidation reduction potential (ORP), field	millivolts	--	-86	200	90	330	300	108	123	-36	--	-27
pH, field	s.u.	--	7.71	6.68	7.76	4.03	4.40	7.05	6.72	6.44	--	6.62
Temperature, field	Deg C	--	15.8	14.8	15.6	14.7	16.2	15.3	15.0	15	--	15.3
Turbidity, field	NTU	--	45	5	22	24	367	11	18	4	--	13

## Notes:

&gt; - Greater than amount shown.

J - Estimated concentration.

U - Not detected at the associated reporting limit.

UJ - Not detected; associated reporting limit is estimated.

-- Not applicable.

Table 1

**Groundwater Analytical Results**  
**NJGWQS Comparison**  
**JIS Landfill Site**

Sample Location:		MW-50D NJDEP Groundwater Sample Date: 10/13/2016	MW-51S 4/14/2016	MW-51I 4/14/2016	MW-51D 4/14/2016	MW-52S 4/12/2016	MW-52I 4/12/2016	MW-52D 4/12/2016	MW-53SR 4/19/2016	MW-53SR 10/10/2016	MW-53IR 4/19/2016	MW-53IR 10/10/2016	MW-53DR 4/19/2016
Parameters	Units	Quality Criterion											
<b>Volatiles</b>													
1,1,1-Trichloroethane	µg/L	30	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U						
1,1,2-Tetrachloroethane	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U						
1,1,2-Trichloroethane	µg/L	3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U						
1,1-Dichloroethane	µg/L	50	0.76 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U					
1,1-Dichloroethene	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U						
1,2,4-Trichlorobenzene	µg/L	9	1.0 U	7.1	7.2	1.3	0.69 J						
1,2-Dichlorobenzene	µg/L	600	1.0 U	1.0 U	0.71 J	1.0 U	1.0 U	1.0 U	0.46 J	0.47 J	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	µg/L	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U						
1,2-Dichloropropane	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	0.43 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	600	0.47 J	1.0 U	2.0	1.9	0.55 J	0.45 J					
1,4-Dichlorobenzene	µg/L	75	0.79 J	1.0 U	7.2	12	13	9.3					
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U						
Acetone	µg/L	6000	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U						
Benzene	µg/L	1	0.31 J	1.0 U	2.1	0.39 J	2.3	0.72 J					
Bromodichloromethane	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U						
Bromoform	µg/L	4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U						
Bromomethane (Methyl bromide)	µg/L	10	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U						
Carbon tetrachloride	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U						
Chlorobenzene	µg/L	50	1.5	1.0 U	5.1	4.2	1.8	0.65 J					
Chloroethane	µg/L	--	0.46 J	1.0 U	2.3	1.3	2.2	0.58 J					
Chloroform (Trichloromethane)	µg/L	70	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U						
Chloromethane (Methyl chloride)	µg/L	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U						
cis-1,2-Dichloroethene	µg/L	70	1.0 U	1.0 U	1.0 U	1.0 U	0.71 J	1.0 U	1.0 U	1.0 U	0.33 J	1.0 U	1.0 U
cis-1,3-Dichloropropene	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U						
Cyclohexane	µg/L	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U						
Dibromochloromethane	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U						
Dichlorodifluoromethane (CFC-12)	µg/L	1000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U						
Ethylbenzene	µg/L	700	1.0 U	0.58 J	1.0 U	1.0 U	1.0 U						
Hexane	µg/L	30	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U						
Methylene chloride	µg/L	3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U						
Tetrachloroethene	µg/L	1	1.0 U	0.22 J	0.66 J	0.60 J	1.0 U	0.13 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	µg/L	600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U						
trans-1,2-Dichloroethene	µg/L	100	0.32 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U					
trans-1,3-Dichloropropene	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U						
Trichloroethene	µg/L	1	0.56 J	1.0 U	1.0 U	1.0 U	0.28 J	1.0 U	1.0 U	0.44 J	0.72 J	1.0 U	0.34 J
Vinyl chloride	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U						
Xylenes (total)	µg/L	1000	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U						
Total VOCs	µg/L	--	5.17	0.22	1.37	0.6	1.42	0.13	ND	27.28	28.51	21.15	12.39
<b>Metals</b>													
Arsenic	µg/L	--	2.1 J	2.5 U	3.5	2.5 U	2.4 J	2.5 U	2.1 J				
Manganese	µg/L	--	65.1	10.0 U	20.1	10.0 U	87.4	127	46.7	258	210	366	375
<b>Field Parameters</b>													
Conductivity, field	umhos/cm	--	1340	1220	1180	678	626	590	179	900	980	1120	1050
Dissolved oxygen (DO), field	mg/L	--	18.53	11.71	20 >	20 >	1.76	2.89	0	12.57	11.54	12.98	12.55
Ferrous iron, field	mg/L	--	0.0	0	0.2	0	0	0	0	NM	4.4	7.8	1.8
Iron	mg/L	--	1.8	0.6	1.6	1	0.2	0.2	0.5	NM	17.4	24	26.0
Oxidation reduction potential (ORP), field	millivolts	--	158	181	183	206	268	341	332	54	34	60	62
pH, field	s.u.	--	5.61	6.36	6.87	6.32	6.53	5.37	5.09	6.26	6.23	5.81	5.55
Temperature, field	Deg C	--	15.0	14.2	14	13.8	14.5	13.6	13.6	17.5	17.3	17.3	16.1
Turbidity, field	NTU	--	87	13	21	24	111	25	45	999 >	420	140	500

Notes:

&gt; - Greater than amount shown.

J - Estimated concentration.

U - Not detected at the associated reporting limit.

UJ - Not detected; associated reporting limit is estimated.

-- Not applicable.

Table 1

**Groundwater Analytical Results**  
**NJGWQS Comparison**  
**JIS Landfill Site**

Sample Location:		MW-53DR 10/10/2016	MW-54S 4/12/2016	MW-54I 4/12/2016	MW-54D 4/12/2016	MW-55S 4/14/2016	MW-55I 4/14/2016	MW-55D 4/14/2016	MW-68S 4/19/2016	MW-68S 10/12/2016	MW-68I 4/19/2016	MW-68I 10/12/2016	MW-68D 4/19/2016	
Sample Date:		NJDEP Groundwater Quality Criterion												
Parameters	Units													
<b>Volatiles</b>														
1,1,1-Trichloroethane	µg/L	30	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
1,1,2-Tetrachloroethane	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
1,1,2-Trichloroethane	µg/L	3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
1,1-Dichloroethane	µg/L	50	1.0 U	0.45 J	0.53 J	0.37 J	0.32 J	1.0 U	1.0 U					
1,1-Dichloroethene	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
1,2,4-Trichlorobenzene	µg/L	9	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
1,2-Dichlorobenzene	µg/L	600	1.0 U	1.0 U	0.73 J	1.0 U	1.0 U	1.0 U	1.0 U	29	1.0 U	11	1.0 U	1.0 U
1,2-Dichloroethane	µg/L	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
1,2-Dichloropropane	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
1,3-Dichlorobenzene	µg/L	600	1.0 U	0.58 J	3.0	1.0 U	0.89 J	1.0 U						
1,4-Dichlorobenzene	µg/L	75	1.0 U	1.0 U	0.41 J	1.0 U	1.0 U	1.0 U	1.0 U	1.4	29	0.34 J	12	1.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U							
Acetone	µg/L	6000	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U							
Benzene	µg/L	1	0.41 J	1.0 U	0.56 J	96	0.86 J	2.3	1.0 U					
Bromodichloromethane	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Bromoform	µg/L	4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Bromomethane (Methyl bromide)	µg/L	10	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Carbon tetrachloride	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Chlorobenzene	µg/L	50	1.0 U	3.4	60	1.0 U	16	1.0 U						
Chloroethane	µg/L	--	1.0 U	6.0	2.5	1.6	1.0 U	1.0 U						
Chloroform (Trichloromethane)	µg/L	70	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Chloromethane (Methyl chloride)	µg/L	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
cis-1,2-Dichloroethene	µg/L	70	1.0 U	8.4	5.5	1.0 U	52	1.4	2.2					
cis-1,3-Dichloropropene	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Cyclohexane	µg/L	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Dibromochloromethane	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Dichlorodifluoromethane (CFC-12)	µg/L	1000	1.0 U	1.0 U	0.89 J	4.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.2	1.1	1.1
Ethylbenzene	µg/L	700	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Hexane	µg/L	30	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Methylene chloride	µg/L	3	1.0 U	0.29 J	1.0 U	1.0 U	1.0 U	1.0 U						
Tetrachloroethene	µg/L	1	1.0 U	0.71 J	2.1	2.0	2.4	1.8	1.0 U	1.0 U	1.0 U	1.6	0.95 J	0.45 J
Toluene	µg/L	600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
trans-1,2-Dichloroethene	µg/L	100	1.0 U	0.47 J	0.85 J	1.0 U	1.0 U	1.0 U						
trans-1,3-Dichloropropene	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Trichloroethene	µg/L	1	1.0 U	0.84 J	1.0 U	1.0 U	20	1.0	1.6					
Vinyl chloride	µg/L	1	1.0 U	0.11 J	14	0.35 J	0.23 J	1.0 U						
Xylenes (total)	µg/L	1000	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U							
Total VOCs	µg/L	--	0.41	0.71	4.13	6	12.9	8.14	ND	13.7	311.38	9.72	48.59	1.84
<b>Metals</b>														
Arsenic	µg/L	--	2.5 U	4.8	4.1	8.6	10.8	3.0						
Manganese	µg/L	--	27.6	10.0 U	10.0 U	19.1	234	70.9	48.1	1040	864	140	157	33.9
<b>Field Parameters</b>														
Conductivity, field	umhos/cm	--	813	1330	1050	654	232	627	168	1860	1640	1430	1230	620
Dissolved oxygen (DO), field	mg/L	--	13.31	13.58	17.17	1.66	1.5	6.14	5.26	0	0.00	0	0.00	0
Ferrous iron, field	mg/L	--	1.7	0	0	0.2	0	0	0	2.6	7.4	5	10.0	3.6
Iron	mg/L	--	10.0	0.6	0	3.6	0.8	0.8	3.5	19.2	8.6	16	14.0	17.6
Oxidation reduction potential (ORP), field	millivolts	--	96	227	247	277	357	294	322	-104	-44	-117	-60	20
pH, field	s.u.	--	6.02	6.91	6.27	5.42	5.31	5.46	5.26	6.5	7.17	6.39	7.34	5.76
Temperature, field	Deg C	--	16.5	14.6	14.3	13.6	13.1	13.1	14.0	16.7	21.5	17.4	16.0	16.1
Turbidity, field	NTU	--	200	10	9	150	22	14	999 >	22	347	370	1000 >	150

## Notes:

&gt; - Greater than amount shown.

J - Estimated concentration.

U - Not detected at the associated reporting limit.

Ud - Not detected; associated reporting limit is estimated.

-- Not applicable.

Table 1

**Groundwater Analytical Results**  
**NJGWQS Comparison**  
**JIS Landfill Site**

Sample Location:		MW-68D 10/12/2016	MW-69S 4/21/2016	MW-69S 10/12/2016	MW-69I 4/21/2016	MW-69I 4/21/2016 Duplicate	MW-69I 10/12/2016	MW-69D 4/21/2016	MW-69D 10/12/2016	MW-69D 10/12/2016	MW-70S 4/21/2016	MW-70S 10/12/2016	MW-70I 4/21/2016	
Sample Date:		NJDEP Groundwater Quality Criterion												
Parameters	Units													
<b>Volatiles</b>														
1,1,1-Trichloroethane	µg/L	30	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Tetrachloroethane	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	µg/L	3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	µg/L	50	1.0 U	0.49 J	1.1	0.45 J	0.43 J	0.53 J	0.61 J	0.53 J	0.46 J	19	3.2	0.28 J
1,1-Dichloroethene	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	µg/L	9	1.0 U	0.29 J	0.30 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4	0.49 J	0.52 J
1,2-Dichlorobenzene	µg/L	600	1.0 U	2.6	6.2	1.0 U	1.0 U	3.2	0.42 J	0.36 J	0.34 J	0.89 J	0.41 J	1.6
1,2-Dichloroethane	µg/L	2	1.0 U	0.60 J	0.73 J	1.0 U	1.0 U	0.32 J	1.0 U	1.0 U	1.0 U	0.72 J	0.54 J	1.0 U
1,2-Dichloropropane	µg/L	1	1.0 U	1.0 U	1.1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5	0.35 J	1.0 U
1,3-Dichlorobenzene	µg/L	600	1.0 U	8.2	10	1.0 U	1.0 U	3.2	2.8	1.8	1.9	2.2	0.72 J	6.7
1,4-Dichlorobenzene	µg/L	75	0.65 J	52	73	1.4	1.3	24	12	11	11	15	4.9	30
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acetone	µg/L	6000	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Benzene	µg/L	1	1.0	200	500	60	58	31	35	12	12	230	9.7	20
Bromodichloromethane	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	µg/L	4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	µg/L	10	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	µg/L	50	0.31 J	26	23	2.7	2.6	8.8	7.4	2.2	2.3	22	5.8	82
Chloroethane	µg/L	--	1.0 U	24	10	4.0	3.9	4.5	5.1	0.84 J	1.6	210	160	15
Chloroform (Trichloromethane)	µg/L	70	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	µg/L	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	µg/L	70	1.0 U	1.8	15	5.8	5.4	0.80 J	0.49 J	0.34 J	0.42 J	12	2.0	0.76 J
cis-1,3-Dichloropropene	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	µg/L	--	1.0 U	12	11	1.2	1.2	3.8	1.7	1.1	0.99 J	12	4.2	0.84 J
Dibromochloromethane	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	1000	1.3 J	1.0 U	1.0 U	0.95 J	0.95 J	0.43 J	0.63 J	1.0 J	1.2	1.0 U	1.0 U	1.0 U
Ethylbenzene	µg/L	700	1.0 U	3.0	3.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.64 J	1.0	1.0 U
Hexane	µg/L	30	1.0 U	1.5	1.3	0.75 J	0.82 J	0.84 J	0.76 J	0.37 J	0.46 J	1.7	0.49 J	1.0 U
Methylene chloride	µg/L	3	1.0 U	1.0 U	1.0 U	0.27 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.4	1.5	0.41 J
Tetrachloroethene	µg/L	1	0.34 J	1.0 U	1.0 U	0.13 J	0.13 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	µg/L	600	1.0 U	0.91 J	1.4	0.39 J	0.39 J	0.72 J	0.33 J	1.0 U	1.0 U	0.96 J	1.4	1.0
trans-1,2-Dichloroethene	µg/L	100	1.0 U	3.0	2.2	0.91 J	0.78 J	1.4	1.0	0.50 J	0.54 J	0.71 J	0.63 J	0.45 J
trans-1,3-Dichloropropene	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	µg/L	1	0.26 J	0.87 J	0.61 J	50	47	2.7	2.9	1.8	1.8	1.0	0.49 J	1.3
Vinyl chloride	µg/L	1	0.069 J	1.2	8.6	2.0	2.1	0.33 J	0.30 J	0.24 J	0.28 J	6.0	0.74 J	0.26 J
Xylenes (total)	µg/L	1000	2.0 U	2.0	1.6 J	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	0.44 J
Total VOCs	µg/L	--	3.929	340.46	670.14	130.95	125	86.57	71.44	34.08	35.29	542.12	197.56	161.56
<b>Metals</b>														
Arsenic	µg/L	--	2.5 U	13.2	12.1	5.5	5.8	7.3	5.6	7.0	7.5	5.0	4.5	9.8
Manganese	µg/L	--	21.2	453	479	242	250	612	303	324	349	3300	3730	1060
<b>Field Parameters</b>														
Conductivity, field	umhos/cm	--	613	1790	1570	924	--	1010	907	566	--	1940	2380	881
Dissolved oxygen (DO), field	mg/L	--	0.00	0	0.00	0	--	0.00	0	0.00	--	0	0.00	3.1
Ferrous iron, field	mg/L	--	2.2	4.6	10.0	6	--	4.0	5.6	4.2	--	6.8	29.0	2.5
Iron	mg/L	--	5.8	16.8	18.2	28	--	11.0	12	8.0	--	12	80.0	4.8
Oxidation reduction potential (ORP), field	millivolts	--	34	-138	-55	-127	--	-57	-126	-66	--	-7	-75	4
pH, field	s.u.	--	5.76	6.34	7.02	6.28	--	6.96	6.19	7.17	--	6.39	6.00	6.41
Temperature, field	Deg C	--	16.6	15.4	16.6	15.5	--	15.7	15.1	16.5	--	15.6	15.3	14.2
Turbidity, field	NTU	--	87	100	93	150	--	237	29	78	--	450	100	62

## Notes:

&gt; - Greater than amount shown.

J - Estimated concentration.

U - Not detected at the associated reporting limit.

UJ - Not detected; associated reporting limit is estimated.

-- Not applicable.

Table 1

**Groundwater Analytical Results**  
**NJGWQS Comparison**  
**JIS Landfill Site**

Sample Location:		MW-70I NJDEP Groundwater Quality Criterion	MW-70D 10/11/2016	MW-70D 4/21/2016	PW-1I 10/11/2016	PW-1I 4/13/2016	PW-1D 10/11/2016	PW-1D 4/13/2016	PW-2I 10/11/2016	PW-2I 4/21/2016	PW-2D 10/11/2016	PW-2D 4/21/2016
Sample Date:												
Parameters	Units											
<b>Volatiles</b>												
1,1,1-Trichloroethane	µg/L	30	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Tetrachloroethane	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	µg/L	3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	µg/L	50	0.35 J	5.0	3.0	0.45 J	0.25 J	1.0 U	1.0 U	0.65 J	0.71 J	0.93 J
1,1-Dichloroethene	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	µg/L	9	0.39 J	1.0 U	0.36 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	µg/L	600	1.6	1.0 U	0.83 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	µg/L	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	600	7.3	1.0 U	3.8	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	µg/L	75	29	1.0 U	18	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acetone	µg/L	6000	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Benzene	µg/L	1	27	15	37	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.18 J
Bromodichloromethane	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	µg/L	4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	µg/L	10	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	µg/L	50	60	1.4	33	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	µg/L	--	11	2.0	9.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	µg/L	70	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	µg/L	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	µg/L	70	0.67 J	1.4	0.92 J	18	8.7	1.0 U	1.0 U	1.0 U	1.0 U	1.3
cis-1,3-Dichloropropene	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.95 J
Cyclohexane	µg/L	--	0.81 J	0.64 J	3.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	1000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	µg/L	700	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Hexane	µg/L	30	1.0 U	1.0 U	0.45 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	µg/L	3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.31 J	1.0 U	0.23 J
Tetrachloroethene	µg/L	1	1.0 U	1.0 U	1.0 U	1.4	0.53 J	0.88 J	0.68 J	1.0 U	1.0 U	1.0 U
Toluene	µg/L	600	1.4	1.0 U	0.94 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	µg/L	100	0.53 J	0.31 J	0.70 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	µg/L	1	1.2	4.2	2.9	11	5.3	1.0 U	1.0 U	0.76 J	0.69 J	3.4
Vinyl chloride	µg/L	1	1.0 U	0.22 J	1.0 U	0.26 J	1.0 U	1.0 U	1.0 U	1.0 U	0.13 J	1.0 U
Xylenes (total)	µg/L	1000	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Total VOCs	µg/L	--	141.25	30.17	114.3	31.11	14.78	0.88	0.68	1.72	1.4	6.17
<b>Metals</b>												
Arsenic	µg/L	--	23.5	8.8	11.1	2.5 U	2.5 U	1.6 J	2.2 J	5.0	5.1	2.0 J
Manganese	µg/L	--	2290	305	1120	48.3	28.4	12.9	29.2	276	1180	326
<b>Field Parameters</b>												
Conductivity, field	umhos/cm	--	4370	560	3390	1100	2720	1110	2520	1060	1460	700
Dissolved oxygen (DO), field	mg/L	--	0.00	0	0.00	19.0	9.64	20 >	9.61	20 >	13.72	16.29
Ferrous iron, field	mg/L	--	7.5	5.6	8.8	0.8	0.0	0.2	0.0	0.8	0.8	1.0
Iron	mg/L	--	15.6	12	15.6	3.6	1.8	2	2.0	15	10.0	15.6
Oxidation reduction potential (ORP), field	millivolts	--	-29	-75	-59	204	201	178	211	165	204	239
pH, field	s.u.	--	6.70	6.95	6.90	6.46	7.30	6.63	7.58	6.5	6.46	4.93
Temperature, field	Deg C	--	16.2	15.1	16.3	13.8	15.3	14.6	16.1	15.5	15.0	15.6
Turbidity, field	NTU	--	251	273	227	24	32	28	153	170	67	99

## Notes:

&gt; - Greater than amount shown.

J - Estimated concentration.

U - Not detected at the associated reporting limit.

UJ - Not detected; associated reporting limit is estimated.

-- Not applicable.

Table 2

**TCE & Benzene Trends  
JIS Landfill**

Location	Well	Mar/May 2015		Oct 2015		Apr 2016		Oct 2016	
		TCE	Benzene	TCE	Benzene	TCE	Benzene	TCE	Benzene
Near Landfill	MW5	ND	6400	43	5500	2	3700	0.3	1300
Sentry Wells	MW68 S	ND	20	ND	2.3	ND	0.6	20	96
	MW68 I	1.9	3.1	1.6	2.2	1.0	0.9	1.6	2.3
	MW68 D	0.3	ND	0.2	0.3	0.3	ND	0.3	1.0
	MW69 S	ND	8200	ND	6600	0.9	200	0.6	500
	MW69 I	60	1300	219	370	49	59	2.7	31
	MW69 D	6	7.2	1.9	0.8	2.9	35	1.8	12
	MW70 S	ND	160	ND	140	1.0	230	0.5	10
	MW70 I	ND	1100	0.5	120	1.3	20	1.2	27
	MW70 D	4.3	170	3.0	70	4.2	15	2.9	37
Upgradient of Biosparge	MP-6 S	ND	700	1.7	310	190	350	190	650
	MP-6 I	0.3	10	3.3	28	370	330	150	450
	MP-6 D	4.9	ND	160	0.3	130	1.4	76	7
100' Downgr adient	MW49 S	0.5	1.9	0.5	1.9	0.4	1.7	0.4	1.6
	MW49 I	2.2	ND	3.2	ND	1.5	ND	1.8	ND

Table 2

**TCE & Benzene Trends  
JIS Landfill**

Location	Well	Mar/May 2015		Oct 2015		Apr 2016		Oct 2016	
		TCE	Benzene	TCE	Benzene	TCE	Benzene	TCE	Benzene
	MW49 D	0.8	ND	0.9	ND	0.8	ND	0.8	ND
	MW50 S	ND	ND	ND	ND	ND	ND	ND	ND
	MW50 I	ND	140	ND	470	ND	0.3	0.3	0.3
	MW50 D	1.1	ND	1.5	0.4	1	ND	0.6	0.3

Note: All Data in ppb

**Table 3**

**Dissolved Oxygen Concentrations  
JIS Landfill Site**

Well #	Mar. 2015	Oct. 2015	Apr. 2016	Oct. 2016
	27th-31st	6th-10th	12th-25th	10th-30th
MW-5	3.42	0.04	0.00	0.00
MP6S-R	6.72	0.00	0.00	0.00
MP6I-R	0.11	0.11	0.00	0.00
MP6D	18.30	19.90	18.93	16.00
MW42S	10.55		blocked	
MW42I	10.48		>20	
MW42D	6.92		7.27	
MW43S	12.22	14.66	13.64	10.96
MW43I	10.10	11.77	17.32	12.61
MW43D	15.50	>20	>20	11.47
MW44S	8.88	7.05	7.64	8.13
MW44I	12.91	10.84	7.04	6.17
MW44D	8.64	>20	>20	>20
MW45S	13.43		11.38	
MW45I	14.81		18.77	
MW45D	15.09		14.50	
MW46S	0.71		0.00	
MW46I	9.18		1.50	
MW46D	>20		>20	
MW52S	7.43		1.76	
MW52I	14.67		2.89	
MW52D	4.63		0.00	
MW53SR		13.03	12.57	11.54
MW53IR		9.97	12.98	12.55
MW53DR		16.28	14.48	13.31
MW54S	11.40		13.58	
MW54I	15.40		17.17	
MW54D	4.87		1.66	
MW55S	10.10		1.5	
MW55I	7.10		6.14	
MW55D	10.51		5.26	
MW47S	7.26		5.18	
MW47I	16.03		6.92	
MW47D	6.57		13.62	
MW48S	9.64		8.3	
MW48I	11.97		7.07	
MW48D	9.98		5.74	
MW49S	1.76	0.00	0.00	0.00
MW49I	6.08	11.58	15.42	11.14
MW49D	6.97	>20	>20	16.33
MW50S	6.03	10.1	9.06	9.23
MW50I	13.20	3.25	4.99	6.17
MW50D	9.60	>20	>20	18.53
MW51S	8.65		11.17	
MW51I	20.30		>20	
MW51D	9.61		>20	
PW1I			19.00	9.04

**Table 3**

Page 2 of 2

**Dissolved Oxygen Concentrations  
JIS Landfill Site**

Well #	Mar. 2015	Oct. 2015	Apr. 2016	Oct. 2016
	27th-31st	6th-10th	12th-25th	10th-30th
PW1D		>20		9.61
PW2I		>20		13.72
PW2D		16.29		19.25
MW68S		0.00		0.00
MW68I		0.00		.00
MW68D		0.00		0.00
MW69S		0.00		0.00
MW69I		0.00		0.00
MW69D		0.00		0.00
PW1I		19		9.04
PW1D		>20		9.61
PW2I		>20		19.25
PW2D		0.00		0.00
MW68S		0.00		0.00
MW68I		0.00		0.00
MW68D		0.00		0.00
MW69S		0.00		0.00
MW69I		0.00		0.00
MW69D		0.00		0.00
MW70S		0.00		0.00
MW70I		3.10		0.00
MW70D		0.00		0.00

Table 4

**Shallow Groundwater Analytical Results**  
**NJGWSL Comparison**  
**JIS Landfill**

Sample Location: Date	NJDEP Generic Vapor Intrusion Groundwater		MP-6SR 4/25/2016	MP-6SR 10/10/2016	MW-5 4/18/2016	MW-5 10/11/2016	MW-43S 4/18/2016	MW-43S 10/13/2016	MW-44S 4/18/2016	MW-44S 10/13/2016	MW-45S 4/13/2016	MW-46S 4/13/2016
Parameters	Units	Screening Levels										
<b>Volatiles</b>												
1,1,1-Trichloroethane	µg/L	13000	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	6	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	µg/L	8	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	µg/L	50	0.47 J	0.52 J	1.0 U	1.0 U	1.0 U	0.35 J	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	µg/L	260	0.56 J	0.60 J	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	µg/L	130	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	µg/L	6800	0.98 J	1.2 J	15 J	7.8	1.0 U	2.5	1.0 U	1.0 U	1.0 U	1.1
1,2-Dichloroethane	µg/L	3	1.0 U	0.26 J	1.0 UJ	1.0 U	2.1	2.4	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	µg/L	4	1.0 U	1.0 UJ	1.0 UJ	1.0 U	1.6	1.7	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	--	4.0	4.6 J	14 J	8.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	µg/L	75	46	53 J	22 J	16	1.0 U	4.2	1.0 U	1.0 U	1.0 U	0.42 J
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	900000	5.0 U	5.0 UJ	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acetone	µg/L	2100000	5.0 U	5.0 UJ	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Benzene	µg/L	20	350	650 J	3700	1300	1.0 U	1.0 U	1.0 U	1.0 U	0.15 J	1.0 U
Bromodichloromethane	µg/L	2	1.0 U	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	µg/L	300	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	µg/L	20	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	µg/L	1	1.0 U	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	µg/L	770	12	11 J	770	430	1.0 U	1.8	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	µg/L	26000	11	5.8 J	23 J	8.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	µg/L	70	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	µg/L	240	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	µg/L	--	60	140 J	1.7 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	9.0	1.0 U
cis-1,3-Dichloropropene	µg/L	7*	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	µg/L	16000	4.2	4.4 J	41 J	95	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	µg/L	6	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	1000	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	µg/L	700	1.0 U	1.0 UJ	9.6 J	2.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Hexane	µg/L	160	1.2	0.93 J	0.58 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	µg/L	920	1.0 U	1.0 UJ	0.60 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	µg/L	31	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.29 J	1.0 U
Toluene	µg/L	330000	1.6	1.3 J	2.0 J	1.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	µg/L	520	3.2	3.7 J	1.0 UJ	1.0 U	0.20 J	0.38 J	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	µg/L	7*	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	µg/L	2	190	190 J	2.1 J	0.33 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	20
Vinyl chloride	µg/L	1	9.8	15 J	0.073 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	µg/L	8600	0.33 J	0.53 J	55 J	13	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Total VOCs	µg/L	--	695.34	1082.84	4656.653	1882.73	3.9	13.33	ND	ND	29.44	1.96

## Notes:

J - Estimated concentration.

U - Not detected at the associated reporting limit.

UJ - Not detected; associated reporting limit is estimated.

## Criteria Notes:

\* - Criteria value for 1,3-Dichloropropene total used.

-- Not applicable.

Table 4

**Shallow Groundwater Analytical Results**  
**NJGWSL Comparison**  
**JIS Landfill**

Sample Location: Date	NJDEP Generic Vapor Intrusion Groundwater		MW-47S 4/14/2016	MW-48S 4/15/2016	MW-49S 4/15/2016	MW-49S 10/13/2016	MW-50S 4/14/2016	MW-50S 10/13/2016	MW-51S 4/14/2016	MW-52S 4/12/2016	MW-53SR 4/19/2016	MW-53SR 10/10/2016
Parameters	Units	Screening Levels										
<b>Volatiles</b>												
1,1,1-Trichloroethane	µg/L	13000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	µg/L	8	1.0 U	0.18 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	µg/L	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	µg/L	260	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	µg/L	130	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	7.1	7.2
1,2-Dichlorobenzene	µg/L	6800	1.0 U	1.0 U	0.47 J	0.73 J	1.0 U	1.0 U	1.0 U	1.0 U	0.46 J	0.47 J
1,2-Dichloroethane	µg/L	3	1.0 U	0.37 J	0.42 J	0.40 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	µg/L	4	0.44 J	0.63 J	0.24 J	0.36 J	1.0 U	1.0 U	1.0 U	0.43 J	1.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0	1.9
1,4-Dichlorobenzene	µg/L	75	1.0 U	1.0 U	2.5	3.8	1.0 U	0.41 J	1.0 U	1.0 U	7.2	12
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	900000	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acetone	µg/L	2100000	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Benzene	µg/L	20	1.0 U	1.0 U	1.7	1.6	1.0 U	1.0 U	1.0 U	1.0 U	2.1	0.39 J
Bromodichloromethane	µg/L	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	µg/L	300	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	µg/L	20	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	µg/L	770	1.0 U	1.0 U	0.49 J	0.64 J	1.0 U	1.0 U	1.0 U	1.0 U	5.1	4.2
Chloroethane	µg/L	26000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.3	1.3
Chloroform (Trichloromethane)	µg/L	70	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	µg/L	240	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	µg/L	--	7.2	1.0 U	1.3	0.51 J	1.0 U	1.0 U	1.0 U	0.71 J	1.0 U	0.33 J
cis-1,3-Dichloropropene	µg/L	7*	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	µg/L	16000	1.0 U	1.0 U	1.0 U	0.47 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	µg/L	6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	1000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	µg/L	700	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.58 J	1.0 U
Hexane	µg/L	160	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	µg/L	920	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	µg/L	31	0.31 J	0.13 J	1.0 U	1.0 U	1.0 U	1.0 U	0.22 J	1.0 U	1.0 U	1.0 U
Toluene	µg/L	330000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	µg/L	520	1.0 U	1.0 U	1.0 U	0.26 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	µg/L	7*	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	µg/L	2	0.68 J	1.0 U	0.40 J	0.41 J	1.0 U	1.0 U	1.0 U	0.28 J	0.44 J	0.72 J
Vinyl chloride	µg/L	1	1.0 U	1.0 U	0.43 J	0.31 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	µg/L	8600	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Total VOCs	µg/L	--	8.63	1.31	7.95	9.49	ND	1.81	0.22	1.42	27.28	28.51

## Notes:

J - Estimated concentration.

U - Not detected at the associated reporting limit.

UJ - Not detected; associated reporting limit is estimated.

## Criteria Notes:

\* - Criteria value for 1,3-Dichloropropene total used.

-- Not applicable.

Table 4

**Shallow Groundwater Analytical Results**  
**NJGWSL Comparison**  
**JIS Landfill**

Sample Location: Date	NJDEP Generic Vapor Intrusion Groundwater		MW-54S 4/12/2016	MW-55S 4/14/2016	MW-68S 4/19/2016	MW-68S 10/12/2016	MW-69S 4/21/2016	MW-69S 10/12/2016	MW-70S 4/21/2016	MW-70S 10/12/2016
Parameters	Units	Screening Levels								
<b>Volatiles</b>										
1,1,1-Trichloroethane	µg/L	13000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	µg/L	8	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	µg/L	50	1.0 U	1.0 U	0.45 J	0.53 J	0.49 J	1.1	19	3.2
1,1-Dichloroethylene	µg/L	260	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	µg/L	130	1.0 U	1.0 U	1.0 U	1.0 U	0.29 J	0.30 J	1.4	0.49 J
1,2-Dichlorobenzene	µg/L	6800	1.0 U	1.0 U	1.0 U	29	2.6	6.2	0.89 J	0.41 J
1,2-Dichloroethane	µg/L	3	1.0 U	1.0 U	1.0 U	1.0 U	0.60 J	0.73 J	0.72 J	0.54 J
1,2-Dichloropropane	µg/L	4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.1	2.5	0.35 J
1,3-Dichlorobenzene	µg/L	--	1.0 U	1.0 U	0.58 J	3.0	8.2	10	2.2	0.72 J
1,4-Dichlorobenzene	µg/L	75	1.0 U	1.0 U	1.4	29	52	73	15	4.9
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	900000	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acetone	µg/L	21000000	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Benzene	µg/L	20	1.0 U	1.0 U	0.56 J	<b>96</b>	<b>200</b>	<b>500</b>	<b>230</b>	9.7
Bromodichloromethane	µg/L	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	µg/L	300	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	µg/L	20	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	µg/L	770	1.0 U	1.0 U	3.4	60	26	23	22	5.8
Chloroethane	µg/L	26000	1.0 U	1.0 U	6.0	2.5	24	10	210	160
Chloroform (Trichloromethane)	µg/L	70	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	µg/L	240	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	µg/L	--	1.0 U	8.4	1.0 U	52	1.8	15	12	2.0
cis-1,3-Dichloropropene	µg/L	7*	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	µg/L	16000	1.0 U	1.0 U	0.44 J	1.2	12	11	12	4.2
Dibromochloromethane	µg/L	6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	1000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	µg/L	700	1.0 U	1.0 U	1.0 U	1.5	3.0	3.0	0.64 J	1.0 U
Hexane	µg/L	160	1.0 U	1.0 U	1.0 U	1.0 U	1.5	1.3	1.7	0.49 J
Methylene chloride	µg/L	920	1.0 U	1.0 U	0.29 J	1.0 U	1.0 U	1.0 U	3.4	1.5
Tetrachloroethene	µg/L	31	0.71 J	2.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	µg/L	330000	1.0 U	1.0 U	1.0 U	1.8	0.91 J	1.4	0.96 J	1.4
trans-1,2-Dichloroethene	µg/L	520	1.0 U	1.0 U	0.47 J	0.85 J	3.0	2.2	0.71 J	0.63 J
trans-1,3-Dichloropropene	µg/L	7*	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	µg/L	2	1.0 U	<b>2.1</b>	1.0 U	<b>20</b>	0.87 J	0.61 J	1.0	0.49 J
Vinyl chloride	µg/L	1	1.0 U	1.0 U	0.11 J	<b>14</b>	<b>1.2</b>	<b>8.6</b>	<b>6.0</b>	0.74 J
Xylenes (total)	µg/L	8600	2.0 U	2.0 U	2.0 U	2.0 U	2.0	1.6 J	2.0 U	2.0 U
Total VOCs	µg/L	--	0.71	12.9	13.7	311.38	340.46	670.14	542.12	197.56

Notes:

J - Estimated concentration.

U - Not detected at the associated reporting limit.

UJ - Not detected; associated reporting limit is estimated.

Criteria Notes:

\* - Criteria value for 1,3-Dichloropropene total used.

-- Not applicable.

Table 5

Page 1 of 1

**Vadose Zone Field Sampling Results**  
**JIS Landfill Site**

Well #	7-Oct-15					27-Apr-16					13-Oct-16				
	PID in Well (ppm)	PID @ Ground level	O2 (%)	CO2 (%)	CH4 (%)	PID in Well (ppm)	PID @ Ground level	O2 (%)	CO2 (%)	CH4 (%)	PID in Well (ppm)	PID @ Ground level	O2 (%)	CO2 (%)	CH4 (%)
MW55V	0.00	0.00	19.30	3.10	0.00	0.00	0.00	19.20	2.90	0.00	0.00	0.00	19.80	2.70	0.00
MW42V	0.00	0.00	19.50	0.80	0.00	0.00	0.00	19.90	0.60	0.00	0.00	0.00	19.40	1.10	0.00
MW43V	0.00	0.00	19.50	0.80	0.00	0.00	0.00	19.60	0.70	0.00	0.00	0.00	19.60	0.80	0.00
MW44V	0.00	0.00	18.40	2.50	0.00	0.00	0.00	18.60	2.20	0.00	0.00	0.00	16.00	5.30	0.00
MW45V	0.00	0.00	19.70	2.10	0.00	0.00	0.00	19.50	2.00	0.00	0.00	0.00	19.30	2.80	0.00
MW46V	0.00	0.00	20.20	1.40	0.00	0.00	0.00	20.20	1.00	0.00	0.00	0.00	20.20	1.30	0.00
MW49V	0.00	0.00	19.90	0.70	0.00	0.00	0.00	19.90	0.50	0.00	0.00	0.00	20.00	0.50	0.10
MW50V	0.00	0.00	18.20	3.90	0.00	0.00	0.00	18.40	3.30	0.00	0.00	0.00	19.10	1.90	0.00
MW65V	0.00	0.00	19.20	3.00	0.00	0.00	0.00	19.70	1.80	0.00	0.00	0.00	18.80	2.70	0.00
MW66V			Buried	could not locate				Buried					Buried		
MW67V	0.00	0.00	19.70	1.80	0.00	0.00	0.00	19.80	1.90	0.00	0.00	0.00	19.90	2.70	0.00

Table 6

**2016 Indoor/Outdoor Air Analytical Results**  
**JIS Landfill Site**  
**March 2016**

Sample Location:		NJ Non-Residential Indoor Air Screening Level	JIS Office 3/3/2016	Outside Ambient 3/3/2016
Parameters	Units			
<b>Volatiles</b>				
1,1,1-Trichloroethane	µg/m³	22000	1 U	1 U
1,1,2,2-Tetrachloroethane	µg/m³	3	1 U	1 U
1,1,2-Trichloroethane	µg/m³	3	1 U	1 U
1,1-Dichloroethane	µg/m³	8	0.8 U	0.8 U
1,1-Dichloroethene	µg/m³	880	0.8 U	0.8 U
1,2,4-Trichlorobenzene	µg/m³	9	4 U	4 U
1,2,4-Trimethylbenzene	µg/m³	--	1 U	1 U
1,2-Dibromoethane (Ethylene dibromide)	µg/m³	4	2 U	2 U
1,2-Dichlorobenzene	µg/m³	880	1 U	1 U
1,2-Dichloroethane	µg/m³	2	0.8 U	0.8 U
1,2-Dichloropropane	µg/m³	2	0.9 U	0.9 U
1,2-Dichlortetrafluoroethane (CFC 114)	µg/m³	--	1 U	1 U
1,3,5-Trimethylbenzene	µg/m³	--	1 U	1 U
1,3-Butadiene	µg/m³	1	0.4 U	0.4 U
1,3-Dichlorobenzene	µg/m³	--	1 U	1 U
1,4-Dichlorobenzene	µg/m³	3	1 U	1 U
1,4-Dioxane	µg/m³	--	18 U	18 U
2,2,4-Trimethylpentane	µg/m³	--	0.9 U	0.9 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/m³	22000	4	1 U
2-Chlorotoluene	µg/m³	--	1 U	1 U
4-Ethyl toluene	µg/m³	--	1 U	1 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/m³	13000	2 U	2 U
Acetone	µg/m³	140000	22	12 U
Allyl chloride	µg/m³	2	2 U	2 U
Benzene	µg/m³	2	1	0.6 U
Bromodichloromethane	µg/m³	3	1 U	1 U
Bromoform	µg/m³	11	2 U	2 U
Bromomethane (Methyl bromide)	µg/m³	22	0.8 U	0.8 U
Carbon disulfide	µg/m³	3100	2 U	2 U
Carbon tetrachloride	µg/m³	3	1 U	1 U
Chlorobenzene	µg/m³	220	0.9 U	0.9 U
Chloroethane	µg/m³	44000	1 U	1 U
Chloroform (Trichloromethane)	µg/m³	2	1 U	1 U
Chloromethane (Methyl chloride)	µg/m³	390	3	1
cis-1,2-Dichloroethene	µg/m³	--	0.8 U	0.8 U
cis-1,3-Dichloropropene	µg/m³	3*	0.9 U	0.9 U
Cyclohexane	µg/m³	26000	0.7 U	0.7 U
Dibromochloromethane	µg/m³	4	2 U	2 U
Dichlorodifluoromethane (CFC-12)	µg/m³	440	2 U	2 U
Ethanol	µg/m³	--	17	9 U
Ethylbenzene	µg/m³	5	0.9 U	0.9 U
Hexachlorobutadiene	µg/m³	5	2 U	2 U
Hexane	µg/m³	3100	2	0.7 U
Isopropyl alcohol	µg/m³	--	12 U	12 U
m&p-Xylenes **	µg/m³	440 **	2 U	2 U
Methyl methacrylate	µg/m³	--	2 U	2 U
Methyl tert butyl ether (MTBE)	µg/m³	47	0.7 U	0.7 U
Methylene chloride	µg/m³	1200	9	2 U
N-Heptane	µg/m³	--	4	0.8 U
o-Xylene **	µg/m³	440 **	0.9 U	0.9 U
Styrene	µg/m³	4400	0.9 U	0.9 U
tert-Butyl alcohol	µg/m³	--	15 U	15 U
Tetrachloroethene	µg/m³	47	1 U	1 U
Tetrahydrofuran	µg/m³	--	15 U	15 U

**Table 6**

**2016 Indoor/Outdoor Air Analytical Results**  
**JIS Landfill Site**  
**March 2016**

<b>Sample Location:</b>		<b>JIS Office</b>	<b>Outside Ambient</b>
<b>Sample Date:</b>		<b>3/3/2016</b>	<b>3/3/2016</b>
<b>Parameters</b>	<b>Units</b>	<b>NJ Non-Residential Indoor Air Screening Level</b>	
Toluene	µg/m <sup>3</sup>	22000	4 0.8 U
trans-1,2-Dichloroethene	µg/m <sup>3</sup>	260	0.8 U 0.8 U
trans-1,3-Dichloropropene	µg/m <sup>3</sup>	3*	0.9 U 0.9 U
Trichloroethene	µg/m <sup>3</sup>	3	1 U 1 U
Trichlorofluoromethane (CFC-11)	µg/m <sup>3</sup>	3100	1 U 1 U
Trifluorotrichloroethane (CFC-113)	µg/m <sup>3</sup>	130000	2 U 2 U
Vinyl bromide (Bromoethene)	µg/m <sup>3</sup>	2	0.9 U 0.9 U
Vinyl chloride	µg/m <sup>3</sup>	3	0.5 U 0.5 U

**Notes:**

U - Not detected at the associated reporting limit.

**Criteria Notes:**

\* - Criteria value for 1,3-Dichloropropene (total) used for comparison.

-- Not applicable.

\*\* Criterial Value for xylenes (total) used for comparison

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